Chapter 8. Polynomials

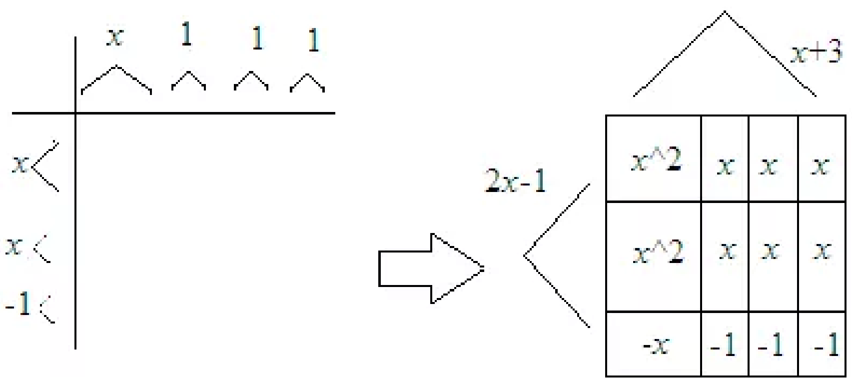
Ex. 8.7

Answer 1CU.

The diagram to show the product of $2x-1$ and $x+3$ using algebra tiles will be a rectangle which can be draw by below.

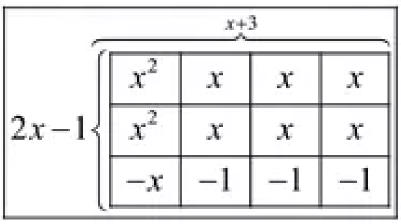
To form a diagram firstly show the product of $(2x-1)(x+3)$ using algebra tiles where $2x-1$ will be the width of the rectangle and $x+3$ will be the length of the rectangle.

Therefore



Hence the diagram to show the product of the product of $2x-1$ and $x+3$ using algebra tiles

is



Answer 2CU.

a) Find the product $(3x+4)(2x-5)$ using distributive property.

So apply the distributive property $a(b+c)=ab+ac$ and solve therefore

$$\begin{aligned}(3x+4)(2x-5) &= 3x(2x-5)+4(2x-5) && \{\text{distributive property}\}\\ &= 3x(2x)+3x(-5)+4(2x)+4(-5) && \{\text{distributive property}\}\\ &= 6x^2-15x+8x-20 && \{\text{multiply}\}\\ &= 6x^2-7x-20 && \{\text{combine like terms}\}\end{aligned}$$

Hence the product of $(3x+4)(2x-5)$ using distributive property is $\boxed{6x^2-7x-20}$

b) Find the product $(3x+4)(2x-5)$ using FOIL method.

To find the product using FOIL method, you have to find the sum of the product of F-first terms, O-outer terms, I-inner terms and L-last terms.

So apply the FOIL method and solve therefore

$$\begin{aligned}(3x+4)(2x-5) &= \underset{\text{product of first terms}}{(3x)(2x)} + \underset{\text{product of outer terms}}{(3x)(-5)} + \underset{\text{product of inner terms}}{(4)(2x)} + \underset{\text{product of last terms}}{(4)(-5)} \\ &= 6x^2 - 15x + 8x - 20 \quad \{\text{multiply}\} \\ &= 6x^2 - 7x - 20 \quad \{\text{combine like terms}\}\end{aligned}$$

Hence the product of $(3x+4)(2x-5)$ using FOIL method is $\boxed{6x^2-7x-20}$

c) Find the product $(3x+4)(2x-5)$ using vertical method.

To find the product using vertical method, firstly write the polynomials in vertical form, therefore

$$\begin{array}{r} 3x+4 \\ \times 2x-5 \\ \hline \end{array}$$

Now begin by multiplying $(3x+4)$ by (-5) and place the terms underneath, therefore

$$\begin{array}{r} 3x+4 \\ \times 2x-5 \\ \hline -15x-20 \end{array}$$

Now finally multiplying $(3x+4)$ by $2x$ and place the terms underneath, therefore

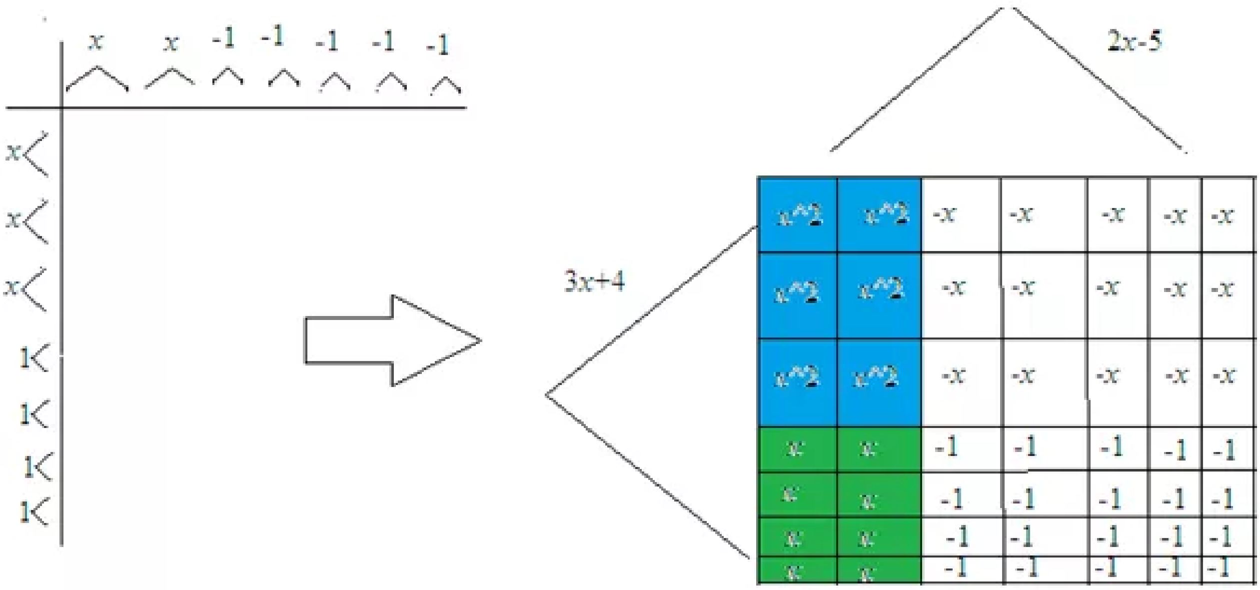
$$\begin{array}{r} 3x+4 \\ \times 2x-5 \\ \hline -15x-20 \\ 6x^2 \quad +8x \quad\; \\ \hline 6x^2-7x-20 \end{array} \quad \{\text{adding like terms}\}$$

Hence the product of $(3x+4)(2x-5)$ using vertical method is $\boxed{6x^2-7x-20}$

d) Find the product $(3x+4)(2x-5)$ using algebra tiles.

The rectangle will have a width of $3x+4$ and a length of $2x-5$. Use algebra tiles to mark off the dimensions on a product mat and then complete the rectangle with algebra tiles.

Therefore

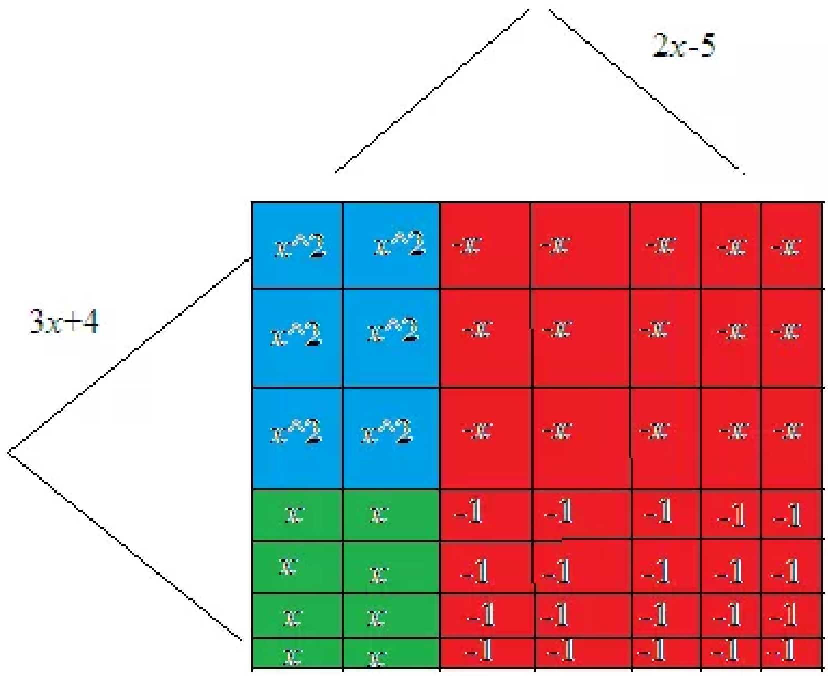


Now determine what color *x* tiles and what color 1 tiles to use to complete the rectangle. The area of each *x* tile is the product of *x* and -1. This is represented by a red $-x$ tile.

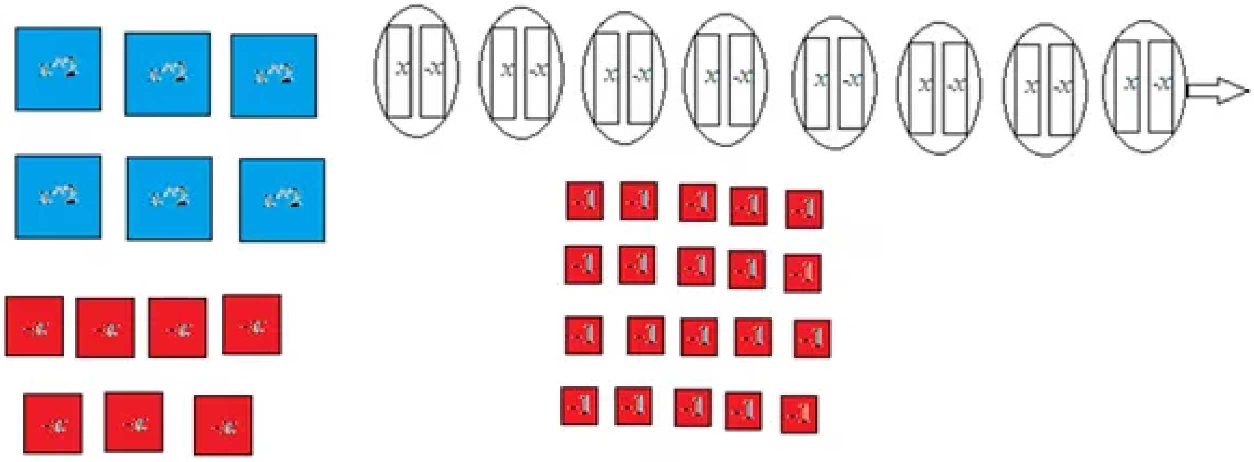
And the area of the 1 tile is represented by the product of 1 and -1 or 1. This is represented by a red 1 tile.

In the above rectangle 1 is multiplied by -1 which is equal to -1 so this is represented by a red 1 tile. So complete the rectangle with 15 red $-x$ tiles and 20 red -1 tiles.

Therefore



Rearrange the tiles to simplify the polynomial you have formed. A zero pair is formed by one positive and one negative *x* tile.



Now there are 6 blue x^2 tile, 7 red $-x$ tiles and 20 red -1 tiles. So, the area of the rectangle is $6x^2-7x-20$

Hence the product of $(3x+4)(2x-5)$ using algebra tiles is $\boxed{6x^2-7x-20}$

Answer 3CU.

There are 4 methods to find the product of two binomials: - 1. Distributive method 2. FOIL method 3. Vertical method 4. Algebra tiles

In the above 4 methods, I prefer FOIL method because it is very easy method to find the product of two binomials and you can apply this method very easily by taking the sum of product of F-first terms, O-outer terms, I-inner terms and L-last terms.

So, I prefer FOIL method to find the multiplication of the binomials.

Answer 4CU.

Find the product $(y+4)(y+3)$

Apply FOIL method to find the product of the above binomials.

In FOIL method, you have to find the sum of the product of F-first terms, O-outer terms, I-inner terms and L-last terms.

So apply the FOIL method and solve therefore

$$\begin{aligned}(y+4)(y+3) &= \underset{\text{product of first terms}}{(y)(y)} + \underset{\text{product of outer terms}}{(y)(3)} + \underset{\text{product of inner terms}}{(4)(y)} + \underset{\text{product of last terms}}{(4)(3)} \\ &= y^2+3y+4y+12 \quad \{\text{multiply}\} \\ &= y^2+7y+12 \quad \{\text{combine like terms}\}\end{aligned}$$

Hence the product of $(y+4)(y+3)$ is $\boxed{y^2+7y+12}$

Answer 5CU.

Find the product $(x-2)(x+6)$

Apply FOIL method to find the product of the above binomials.

In FOIL method, you have to find the sum of the product of F-first terms, O-outer terms, I-inner terms and L-last terms.

So apply the FOIL method and solve therefore

$$
\begin{aligned}
(x-2)(x+6) &= \underset{\substack{\text{product of}\\ \text{first terms}}}{(x)(x)} + \underset{\substack{\text{product of}\\ \text{outer terms}}}{(x)(6)} + \underset{\substack{\text{product of}\\ \text{inner terms}}}{(-2)(x)} + \underset{\substack{\text{product of}\\ \text{last terms}}}{(-2)(6)} \\
&= x^2 + 6x - 2x - 12 \quad \{\text{multiply}\} \\
&= x^2 + 4x - 12 \quad \{\text{combine like terms}\}
\end{aligned}
$$

Hence the product of $(x-2)(x+6)$ is $\boxed{x^2+4x-12}$

Answer 6CU.

Find the product $(a-8)(a+5)$

Apply FOIL method to find the product of the above binomials.

In FOIL method, you have to find the sum of the product of F-first terms, O-outer terms, I-inner terms and L-last terms.

So apply the FOIL method and solve therefore

$$
\begin{aligned}
(a-8)(a+5) &= \underset{\substack{\text{product of}\\ \text{first terms}}}{(a)(a)} + \underset{\substack{\text{product of}\\ \text{outer terms}}}{(a)(5)} + \underset{\substack{\text{product of}\\ \text{inner terms}}}{(-8)(a)} + \underset{\substack{\text{product of}\\ \text{last terms}}}{(-8)(5)} \\
&= a^2 + 5a - 8a - 40 \quad \{\text{multiply}\} \\
&= a^2 - 3a - 40 \quad \{\text{combine like terms}\}
\end{aligned}
$$

Hence the product of $(a-8)(a+5)$ is $\boxed{a^2-3a-40}$

Answer 7CU.

Find the product $(4h+5)(h+7)$

Apply FOIL method to find the product of the above binomials.

In FOIL method, you have to find the sum of the product of F-first terms, O-outer terms, I-inner terms and L-last terms.

So apply the FOIL method and solve therefore

$$
\begin{aligned}
(4h+5)(h+7) &= \underset{\substack{\text{product of}\\ \text{first terms}}}{(4h)(h)} + \underset{\substack{\text{product of}\\ \text{outer terms}}}{(4h)(7)} + \underset{\substack{\text{product of}\\ \text{inner terms}}}{(5)(h)} + \underset{\substack{\text{product of}\\ \text{last terms}}}{(5)(7)} \\
&= 4h^2 + 28h + 5h + 35 \quad \{\text{multiply}\} \\
&= 4h^2 + 33h + 35 \quad \{\text{combine like terms}\}
\end{aligned}
$$

Hence the product of $(4h+5)(h+7)$ is $\boxed{4h^2+33h+35}$

Answer 8CU.

Find the product $(9p-1)(3p-2)$

Apply FOIL method to find the product of the above binomials.

In FOIL method, you have to find the sum of the product of F-first terms, O-outer terms, I-inner terms and L-last terms.

So apply the FOIL method and solve therefore

$$
\begin{aligned}
(9p-1)(3p-2) &= \underset{\substack{\text{product of}\\ \text{first terms}}}{(9p)(3p)} + \underset{\substack{\text{product of}\\ \text{outer terms}}}{(9p)(-2)} + \underset{\substack{\text{product of}\\ \text{inner terms}}}{(-1)(3p)} + \underset{\substack{\text{product of}\\ \text{last terms}}}{(-1)(-2)} \\
&= 27p^2 - 18p - 3p + 2 \quad \{\text{multiply}\} \\
&= 27p^2 - 21p + 2 \quad \{\text{combine like terms}\}
\end{aligned}
$$

Hence the product of $(9p-1)(3p-2)$ is $\boxed{27p^2-21p+2}$

Answer 9CU.

Find the product $(2g+7)(5g-8)$

Apply FOIL method to find the product of the above binomials.

In FOIL method, you have to find the sum of the product of F-first terms, O-outer terms, I-inner terms and L-last terms.

So apply the FOIL method and solve therefore

$$\begin{aligned}(2g+7)(5g-8) &= \underset{\substack{\text{product of}\\ \text{first terms}}}{(2g)(5g)} + \underset{\substack{\text{product of}\\ \text{outer terms}}}{(2g)(-8)} + \underset{\substack{\text{product of}\\ \text{inner terms}}}{(7)(5g)} + \underset{\substack{\text{product of}\\ \text{last terms}}}{(7)(-8)}\\ &= 10g^2 - 16g + 35g - 56 \quad \{\text{multiply}\}\\ &= 10g^2 + 19g - 56 \quad \{\text{combine like terms}\}\end{aligned}$$

Hence the product of $(2g+7)(5g-8)$ is $\boxed{10g^2+19g-56}$

Answer 10CU.

Find the product $(3b-2c)(6b+5c)$

Apply FOIL method to find the product of the above binomials.

In FOIL method, you have to find the sum of the product of F-first terms, O-outer terms, I-inner terms and L-last terms.

So apply the FOIL method and solve therefore

$$\begin{aligned}(3b-2c)(6b+5c) &= \underset{\substack{\text{product of}\\ \text{first terms}}}{(3b)(6b)} + \underset{\substack{\text{product of}\\ \text{outer terms}}}{(3b)(5c)} + \underset{\substack{\text{product of}\\ \text{inner terms}}}{(-2c)(6b)} + \underset{\substack{\text{product of}\\ \text{last terms}}}{(-2c)(5c)}\\ &= 18b^2 + 15bc - 12bc - 10c^2 \quad \{\text{multiply}\}\\ &= 18b^2 + 3bc - 10c^2 \quad \{\text{combine like terms}\}\end{aligned}$$

Hence the product of $(3b-2c)(6b+5c)$ is $\boxed{18b^2+3bc-10c^2}$

Answer 11CU.

Find the product $(3k-5)(2k^2+4k-3)$

There are two polynomials given so you can not apply FOIL method here because FOIL method is used to find the product of two binomials so apply distributive property $a(b+c)=ab+ac$ to find the product and solve therefore

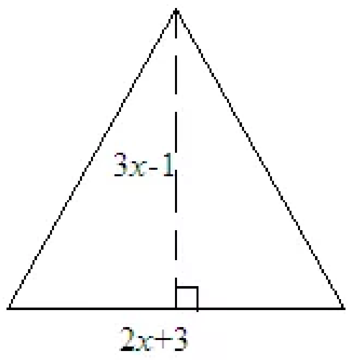
$$\begin{aligned}
&(3k-5)(2k^2+4k-3) \\
&=3k(2k^2+4k-3)-5(2k^2+4k-3) && \{\text{distributive property}\} \\
&=3k(2k^2)+3k(4k)+3k(-3)-5(2k^2)-5(4k)-5(-3) && \{\text{distributive property}\} \\
&=6k^3+12k^2-9k-10k^2-20k+15 && \{\text{multiply}\} \\
&=6k^3+2k^2-29k+15 && \{\text{combine like terms}\}
\end{aligned}$$

Hence the product of $(3k-5)(2k^2+4k-3)$ using distributive property is

$\boxed{6k^3+2k^2-29k+15}$

Answer 12CU.

According to the below figure, the height of the triangle is $3x-1$ and base is $2x+3$



Find an expression to represent the area of the triangle.

According to the given statement, the area *A* of a triangle is half the product of the base *b* times the height *h*. This can be written as $A=\frac{1}{2}\times h\times b$ where *A* is the area, *h* is the height and *b* is the base of the triangle.

So substituting $h=3x-1$ and $b=2x+3$ in the above formula of area, therefore

$$\begin{aligned}
A&=\frac{1}{2}\times h\times b \\
&=\frac{1}{2}\times(3x-1)\times(2x+3)
\end{aligned}$$

Apply FOIL method to find the expression of the area, therefore

$$\begin{aligned} A &= \frac{1}{2}\times(3x-1)\times(2x+3) \\ &= \frac{1}{2}\times\left[3x(2x)+3x(3)-1(2x)-1(3)\right] && \{\text{FOIL method}\} \\ &= \frac{1}{2}\times\left[6x^2+9x-2x-3\right] && \{\text{multiply}\} \\ &= \frac{1}{2}\times\left[6x^2+7x-3\right] && \{\text{combine like terms}\} \end{aligned}$$

$$= \frac{6x^2}{2}+\frac{7x}{2}-\frac{3}{2}$$

$$= 3x^2+\frac{7}{2}x-\frac{3}{2}$$

Hence the expression for the area *A* of the figure is $\boxed{3x^2+\frac{7}{2}x-\frac{3}{2}\text{ sq. units}}$

Answer 13PA.

Find the product $(b+8)(b+2)$

Apply FOIL method to find the product of the above binomials.

In FOIL method, you have to find the sum of the product of F-first terms, O-outer terms, I-inner terms and L-last terms.

So apply the FOIL method and solve therefore

$$\begin{aligned} (b+8)(b+2) &= \underset{\text{product of first terms}}{(b)(b)} + \underset{\text{product of outer terms}}{(b)(2)} + \underset{\text{product of inner terms}}{(8)(b)} + \underset{\text{product of last terms}}{(8)(2)} \\ &= b^2+2b+8b+16 && \{\text{multiply}\} \\ &= b^2+10b+16 && \{\text{combine like terms}\} \end{aligned}$$

Hence the product of $(b+8)(b+2)$ is $\boxed{b^2+10b+16}$

Answer 14PA.

Find the product $(n+6)(n+7)$

Apply FOIL method to find the product of the above binomials.

In FOIL method, you have to find the sum of the product of F-first terms, O-outer terms, I-inner terms and L-last terms.

So apply the FOIL method and solve therefore

$$\begin{aligned}(n+6)(n+7) &= \underset{\text{product of first terms}}{(n)(n)} + \underset{\text{product of outer terms}}{(n)(7)} + \underset{\text{product of inner terms}}{(6)(n)} + \underset{\text{product of last terms}}{(6)(7)} \\ &= n^2+7n+6n+42 \quad \{\text{multiply}\} \\ &= n^2+13n+42 \quad \{\text{combine like terms}\}\end{aligned}$$

Hence the product of $(n+6)(n+7)$ is $\boxed{n^2+13n+42}$

Answer 15PA.

Find the product $(x-4)(x-9)$

Apply FOIL method to find the product of the above binomials.

In FOIL method, you have to find the sum of the product of F-first terms, O-outer terms, I-inner terms and L-last terms.

So apply the FOIL method and solve therefore

$$\begin{aligned}(x-4)(x-9) &= \underset{\text{product of first terms}}{(x)(x)} + \underset{\text{product of outer terms}}{(x)(-9)} + \underset{\text{product of inner terms}}{(-4)(x)} + \underset{\text{product of last terms}}{(-4)(-9)} \\ &= x^2-9x-4x+36 \quad \{\text{multiply}\} \\ &= x^2-13x+36 \quad \{\text{combine like terms}\}\end{aligned}$$

Hence the product of $(x-4)(x-9)$ is $\boxed{x^2-13x+36}$

Answer 16PA.

Find the product $(a-3)(a-5)$

Apply FOIL method to find the product of the above binomials.

In FOIL method, you have to find the sum of the product of F-first terms, O-outer terms, I-inner terms and L-last terms.

So apply the FOIL method and solve therefore

$$\begin{aligned}(a-3)(a-5) &= \underset{\substack{\text{product of}\\\text{first terms}}}{(a)(a)} + \underset{\substack{\text{product of}\\\text{outer terms}}}{(a)(-5)} + \underset{\substack{\text{product of}\\\text{inner terms}}}{(-3)(a)} + \underset{\substack{\text{product of}\\\text{last terms}}}{(-3)(-5)} \\ &= a^2 - 5a - 3a + 15 \quad \{\text{multiply}\} \\ &= a^2 - 8a + 15 \quad \{\text{combine like terms}\}\end{aligned}$$

Hence the product of $(a-3)(a-5)$ is $\boxed{a^2 - 8a + 15}$

Answer 17PA.

Find the product $(y+4)(y-8)$

Apply FOIL method to find the product of the above binomials.

In FOIL method, you have to find the sum of the product of F-first terms, O-outer terms, I-inner terms and L-last terms.

So apply the FOIL method and solve therefore

$$\begin{aligned}(y+4)(y-8) &= \underset{\substack{\text{product of}\\\text{first terms}}}{(y)(y)} + \underset{\substack{\text{product of}\\\text{outer terms}}}{(y)(-8)} + \underset{\substack{\text{product of}\\\text{inner terms}}}{(4)(y)} + \underset{\substack{\text{product of}\\\text{last terms}}}{(4)(-8)} \\ &= y^2 - 8y + 4y - 32 \quad \{\text{multiply}\} \\ &= y^2 - 4y - 32 \quad \{\text{combine like terms}\}\end{aligned}$$

Hence the product of $(y+4)(y-8)$ is $\boxed{y^2 - 4y - 32}$

Answer 18PA.

Find the product $(p+2)(p-10)$

Apply FOIL method to find the product of the above binomials.

In FOIL method, you have to find the sum of the product of F-first terms, O-outer terms, I-inner terms and L-last terms.

So apply the FOIL method and solve therefore

$$\begin{aligned}(p+2)(p-10) &= \underset{\substack{\text{product of}\\\text{first terms}}}{(p)(p)} + \underset{\substack{\text{product of}\\\text{outer terms}}}{(p)(-10)} + \underset{\substack{\text{product of}\\\text{inner terms}}}{(2)(p)} + \underset{\substack{\text{product of}\\\text{last terms}}}{(2)(-10)}\\ &= p^2 - 10p + 2p - 20 \quad \{\text{multiply}\}\\ &= p^2 - 8p - 20 \quad \{\text{combine like terms}\}\end{aligned}$$

Hence the product of $(p+2)(p-10)$ is $\boxed{p^2 - 8p - 20}$

Answer 19PA.

Find the product $(2w-5)(w+7)$

Apply FOIL method to find the product of the above binomials.

In FOIL method, you have to find the sum of the product of F-first terms, O-outer terms, I-inner terms and L-last terms.

So apply the FOIL method and solve therefore

$$\begin{aligned}(2w-5)(w+7) &= \underset{\substack{\text{product of}\\\text{first terms}}}{(2w)(w)} + \underset{\substack{\text{product of}\\\text{outer terms}}}{(2w)(7)} + \underset{\substack{\text{product of}\\\text{inner terms}}}{(-5)(w)} + \underset{\substack{\text{product of}\\\text{last terms}}}{(-5)(7)}\\ &= 2w^2 + 14w - 5w - 35 \quad \{\text{multiply}\}\\ &= 2w^2 + 9w - 35 \quad \{\text{combine like terms}\}\end{aligned}$$

Hence the product of $(2w-5)(w+7)$ is $\boxed{2w^2 + 9w - 35}$

Answer 20PA.

Find the product $(k+12)(3k-2)$

Apply FOIL method to find the product of the above binomials.

In FOIL method, you have to find the sum of the product of F-first terms, O-outer terms, I-inner terms and L-last terms.

So apply the FOIL method and solve therefore

$$\begin{aligned}(k+12)(3k-2) &= \underset{\substack{\text{product of}\\ \text{first terms}}}{(k)(3k)} + \underset{\substack{\text{product of}\\ \text{outer terms}}}{(k)(-2)} + \underset{\substack{\text{product of}\\ \text{inner terms}}}{(12)(3k)} + \underset{\substack{\text{product of}\\ \text{last terms}}}{(12)(-2)}\\ &= 3k^2-2k+36k-24 \quad \{\text{multiply}\}\\ &= 3k^2+34k-24 \quad \{\text{combine like terms}\}\end{aligned}$$

Hence the product of $(k+12)(3k-2)$ is $\boxed{3k^2+34k-24}$

Answer 21PA.

Find the product $(8d+3)(5d+2)$

Apply FOIL method to find the product of the above binomials.

In FOIL method, you have to find the sum of the product of F-first terms, O-outer terms, I-inner terms and L-last terms.

So apply the FOIL method and solve therefore

$$\begin{aligned}(8d+3)(5d+2) &= \underset{\substack{\text{product of}\\ \text{first terms}}}{(8d)(5d)} + \underset{\substack{\text{product of}\\ \text{outer terms}}}{(8d)(2)} + \underset{\substack{\text{product of}\\ \text{inner terms}}}{(3)(5d)} + \underset{\substack{\text{product of}\\ \text{last terms}}}{(3)(2)}\\ &= 40d^2+16d+15d+6 \quad \{\text{multiply}\}\\ &= 40d^2+31d+6 \quad \{\text{combine like terms}\}\end{aligned}$$

Hence the product of $(8d+3)(5d+2)$ is $\boxed{40d^2+31d+6}$

Answer 22PA.

Find the product $(4g+3)(9g+6)$

Apply FOIL method to find the product of the above binomials.

In FOIL method, you have to find the sum of the product of F-first terms, O-outer terms, I-inner terms and L-last terms.

So apply the FOIL method and solve therefore

$$\begin{aligned}(4g+3)(9g+6) &= \underset{\substack{\text{product of}\\ \text{first terms}}}{(4g)(9g)} + \underset{\substack{\text{product of}\\ \text{outer terms}}}{(4g)(6)} + \underset{\substack{\text{product of}\\ \text{inner terms}}}{(3)(9g)} + \underset{\substack{\text{product of}\\ \text{last terms}}}{(3)(6)} \\ &= 36g^2+24g+27g+18 \quad \{\text{multiply}\} \\ &= 36g^2+51g+18 \quad \{\text{combine like terms}\}\end{aligned}$$

Hence the product of $(4g+3)(9g+6)$ is $\boxed{36g^2+51g+18}$

Answer 23PA.

Find the product $(7x-4)(5x-1)$

Apply FOIL method to find the product of the above binomials.

In FOIL method, you have to find the sum of the product of F-first terms, O-outer terms, I-inner terms and L-last terms.

So apply the FOIL method and solve therefore

$$\begin{aligned}(7x-4)(5x-1) &= \underset{\substack{\text{product of}\\ \text{first terms}}}{(7x)(5x)} + \underset{\substack{\text{product of}\\ \text{outer terms}}}{(7x)(-1)} + \underset{\substack{\text{product of}\\ \text{inner terms}}}{(-4)(5x)} + \underset{\substack{\text{product of}\\ \text{last terms}}}{(-4)(-1)} \\ &= 35x^2-7x-20x+4 \quad \{\text{multiply}\} \\ &= 35x^2-27x+4 \quad \{\text{combine like terms}\}\end{aligned}$$

Hence the product of $(7x-4)(5x-1)$ is $\boxed{35x^2-27x+4}$

Answer 25PA.

Find the product $(2n+3)(2n+3)$

Apply FOIL method to find the product of the above binomials.

In FOIL method, you have to find the sum of the product of F-first terms, O-outer terms, I-inner terms and L-last terms.

So apply the FOIL method and solve therefore

$$\begin{aligned}(2n+3)(2n+3) &= \underset{\substack{\text{product of}\\\text{first terms}}}{(2n)(2n)} + \underset{\substack{\text{product of}\\\text{outer terms}}}{(2n)(3)} + \underset{\substack{\text{product of}\\\text{inner terms}}}{(3)(2n)} + \underset{\substack{\text{product of}\\\text{last terms}}}{(3)(3)} \\ &= 4n^2+6n+6n+9 \quad \{\text{multiply}\} \\ &= 4n^2+12n+9 \quad \{\text{combine like terms}\}\end{aligned}$$

Hence the product of $(2n+3)(2n+3)$ is $\boxed{4n^2+12n+9}$

Answer 26PA.

Find the product $(5m-6)(5m-6)$

Apply FOIL method to find the product of the above binomials.

In FOIL method, you have to find the sum of the product of F-first terms, O-outer terms, I-inner terms and L-last terms.

So apply the FOIL method and solve therefore

$$\begin{aligned}(5m-6)(5m-6) &= \underset{\substack{\text{product of}\\\text{first terms}}}{(5m)(5m)} + \underset{\substack{\text{product of}\\\text{outer terms}}}{(5m)(-6)} + \underset{\substack{\text{product of}\\\text{inner terms}}}{(-6)(5m)} + \underset{\substack{\text{product of}\\\text{last terms}}}{(-6)(-6)} \\ &= 25m^2-30m-30m+36 \quad \{\text{multiply}\} \\ &= 25m^2-60m+36 \quad \{\text{combine like terms}\}\end{aligned}$$

Hence the product of $(5m-6)(5m-6)$ is $\boxed{25m^2-60m+36}$

Answer 27PA.

Find the product $(10r-4)(10r+4)$

Apply FOIL method to find the product of the above binomials.

In FOIL method, you have to find the sum of the product of F-first terms, O-outer terms, I-inner terms and L-last terms.

So apply the FOIL method and solve therefore

$$\begin{aligned}(10r-4)(10r+4) &= \underset{\text{product of first terms}}{(10r)(10r)} + \underset{\text{product of outer terms}}{(10r)(4)} + \underset{\text{product of inner terms}}{(-4)(10r)} + \underset{\text{product of last terms}}{(-4)(4)} \\ &= 100r^2 + 40r - 40r - 16 \quad \{\text{multiply}\} \\ &= 100r^2 - 16 \quad \{\text{combine like terms}\}\end{aligned}$$

Hence the product of $(10r-4)(10r+4)$ is $\boxed{100r^2-16}$

Answer 28PA.

Find the product $(7t+5)(7t-5)$

Apply FOIL method to find the product of the above binomials.

In FOIL method, you have to find the sum of the product of F-first terms, O-outer terms, I-inner terms and L-last terms.

So apply the FOIL method and solve therefore

$$\begin{aligned}(7t+5)(7t-5) &= \underset{\text{product of first terms}}{(7t)(7t)} + \underset{\text{product of outer terms}}{(7t)(-5)} + \underset{\text{product of inner terms}}{(5)(7t)} + \underset{\text{product of last terms}}{(5)(-5)} \\ &= 49t^2 - 35t + 35t - 25 \quad \{\text{multiply}\} \\ &= 49t^2 - 25 \quad \{\text{combine like terms}\}\end{aligned}$$

Hence the product of $(7t+5)(7t-5)$ is $\boxed{49t^2-25}$

Answer 29PA.

Find the product $(8x+2y)(5x-4y)$

Apply FOIL method to find the product of the above binomials.

In FOIL method, you have to find the sum of the product of F-first terms, O-outer terms, I-inner terms and L-last terms.

So apply the FOIL method and solve therefore

$$\begin{aligned}(8x+2y)(5x-4y) &= \underset{\text{first terms}}{\overset{\text{product of}}{(8x)(5x)}} + \underset{\text{outer terms}}{\overset{\text{product of}}{(8x)(-4y)}} + \underset{\text{inner terms}}{\overset{\text{product of}}{(2y)(5x)}} + \underset{\text{last terms}}{\overset{\text{product of}}{(2y)(-4y)}} \\ &= 40x^2-32xy+10xy-8y^2 \quad \{\text{multiply}\} \\ &= 40x^2-22xy-8y^2 \quad \{\text{combine like terms}\}\end{aligned}$$

Hence the product of $(8x+2y)(5x-4y)$ is $\boxed{40x^2-22xy-8y^2}$

Answer 30PA.

Find the product $(11a-6b)(2a+3b)$

Apply FOIL method to find the product of the above binomials.

In FOIL method, you have to find the sum of the product of F-first terms, O-outer terms, I-inner terms and L-last terms.

So apply the FOIL method and solve therefore

$$\begin{aligned}(11a-6b)(2a+3b) &= \underset{\text{first terms}}{\overset{\text{product of}}{(11a)(2a)}} + \underset{\text{outer terms}}{\overset{\text{product of}}{(11a)(3b)}} + \underset{\text{inner terms}}{\overset{\text{product of}}{(-6b)(2a)}} + \underset{\text{last terms}}{\overset{\text{product of}}{(-6b)(3b)}} \\ &= 22a^2+33ab-12ab-18b^2 \quad \{\text{multiply}\} \\ &= 22a^2+21ab-18b^2 \quad \{\text{combine like terms}\}\end{aligned}$$

Hence the product of $(11a-6b)(2a+3b)$ is $\boxed{22a^2+21ab-18b^2}$

Answer 31PA.

Find the product $(p+4)(p^2+2p-7)$

There are two polynomials given so you can not apply FOIL method here because FOIL method is used to find the product of two binomials so apply distributive property $a(b+c)=ab+ac$ to find the product and solve therefore

$$\begin{aligned}
&(p+4)(p^2+2p-7) && \\
&= p(p^2+2p-7)+4(p^2+2p-7) && \{\text{distributive property}\} \\
&= p(p^2)+p(2p)+p(-7)+4(p^2)+4(2p)+4(-7) && \{\text{distributive property}\} \\
&= p^3+2p^2-7p+4p^2+8p-28 && \{\text{multiply}\} \\
&= p^3+6p^2+p-28 && \{\text{combine like terms}\}
\end{aligned}$$

Hence the product of $(p+4)(p^2+2p-7)$ is $\boxed{p^3+6p^2+p-28}$

Answer 32PA.

Find the product $(a-3)(a^2-8a+5)$

There are two polynomials given so you can not apply FOIL method here because FOIL method is used to find the product of two binomials so apply distributive property $a(b+c)=ab+ac$ to find the product and solve therefore

$$\begin{aligned}
&(a-3)(a^2-8a+5) && \\
&= a(a^2-8a+5)-3(a^2-8a+5) && \{\text{distributive property}\} \\
&= a(a^2)+a(-8a)+a(5)-3(a^2)-3(-8a)-3(5) && \{\text{distributive property}\} \\
&= a^3-8a^2+5a-3a^2+24a-15 && \{\text{multiply}\} \\
&= a^3-11a^2+29a-15 && \{\text{combine like terms}\}
\end{aligned}$$

Hence the product of $(a-3)(a^2-8a+5)$ is $\boxed{a^3-11a^2+29a-15}$

Answer 33PA.

Find the product $(2x-5)(3x^2-4x+1)$

There are two polynomials given so you can not apply FOIL method here because FOIL method is used to find the product of two binomials so apply distributive property $a(b+c)=ab+ac$ to find the product and solve therefore

$$
\begin{aligned}
&(2x-5)(3x^2-4x+1) \\
&=2x(3x^2-4x+1)-5(3x^2-4x+1) && \{\text{distributive property}\} \\
&=2x(3x^2)+2x(-4x)+2x(1)-5(3x^2)-5(-4x)-5(1) && \{\text{distributive property}\} \\
&=6x^3-8x^2+2x-15x^2+20x-5 && \{\text{multiply}\} \\
&=6x^3-23x^2+22x-5 && \{\text{combine like terms}\}
\end{aligned}
$$

Hence the product of $(2x-5)(3x^2-4x+1)$ is $\boxed{6x^3-23x^2+22x-5}$

Answer 34PA.

Find the product $(3k+4)(7k^2+2k-9)$

Apply distributive property to find the product and solve therefore

$$
\begin{aligned}
&(3k+4)(7k^2+2k-9) \\
&=3k(7k^2+2k-9)+4(7k^2+2k-9) && \{\text{distributive property}\} \\
&=3k(7k^2)+3k(2k)+3k(-9)+4(7k^2)+4(2k)+4(-9) && \{\text{distributive property}\} \\
&=21k^3+6k^2-27k+28k^2+8k-36 && \{\text{multiply}\} \\
&=21k^3+34k^2-19k-36 && \{\text{combine like terms}\}
\end{aligned}
$$

Hence the product of $(3k+4)(7k^2+2k-9)$ is $\boxed{21k^3+34k^2-19k-36}$

Answer 35PA.

Find the product $(n^2-3n+2)(n^2+5n-4)$

Apply distributive property to find the product and solve therefore

$$
\begin{aligned}
&(n^2-3n+2)(n^2+5n-4) \\
&=n^2(n^2+5n-4)-3n(n^2+5n-4)+2(n^2+5n-4) && \{\text{distributive property}\} \\
&=n^2(n^2)+n^2(5n)+n^2(-4)-3n(n^2)-3n(5n)-3n(-4)+2(n^2)+2(5n)+2(-4) && \{\text{distributive property}\} \\
&=n^4+5n^3-4n^2-3n^3-15n^2+12n+2n^2+10n-8 && \{\text{multiply}\} \\
&=n^4+2n^3-17n^2+22n-8 && \{\text{combine like terms}\}
\end{aligned}
$$

Hence the product of $(n^2-3n+2)(n^2+5n-4)$ is $\boxed{n^4+2n^3-17n^2+22n-8}$

Answer 36PA.

Find the product $\left(y^2+7y-1\right)\left(y^2-6y+5\right)$

Apply distributive property to find the product and solve, therefore

$$
\begin{aligned}
&\left(y^2+7y-1\right)\left(y^2-6y+5\right) \\
&= y^2\left(y^2-6y+5\right)+7y\left(y^2-6y+5\right)-1\left(y^2-6y+5\right) && \{\text{distributive property}\} \\
&= y^2\left(y^2\right)+y^2(-6y)+y^2(5)+7y\left(y^2\right)+7y(-6y)+7y(5)-1\left(y^2\right)-1(-6y)-1(5) && \{\text{distributive property}\} \\
&= y^4-6y^3+5y^2+7y^3-42y^2+35y-y^2+6y-5 && \{\text{multiply}\} \\
&= y^4+y^3-38y^2+41y-5 && \{\text{combine like terms}\}
\end{aligned}
$$

Hence the product of $\left(y^2+7y-1\right)\left(y^2-6y+5\right)$ is $\boxed{y^4+y^3-38y^2+41y-5}$

Answer 37PA.

Find the product $\left(4a^2+3a-7\right)\left(2a^2-a+8\right)$

Apply distributive property to find the product and solve, therefore

$$
\begin{aligned}
&\left(4a^2+3a-7\right)\left(2a^2-a+8\right) \\
&= 4a^2\left(2a^2-a+8\right)+7y\left(2a^2-a+8\right)-1\left(2a^2-a+8\right) && \{\text{distributive property}\} \\
&= 4a^2\left(2a^2\right)+4a^2(-a)+4a^2(8)+3a\left(2a^2\right)+3a(-a)+3a(8)-7\left(2a^2\right)-7(-a)-7(8) && \{\text{distributive property}\} \\
&= 8a^4-4a^3+32a^2+6a^3-3a^2+24a-14a^2+7a-56 && \{\text{multiply}\} \\
&= 8a^4+2a^3+15a^2+31a-56 && \{\text{combine like terms}\}
\end{aligned}
$$

Hence the product of $\left(4a^2+3a-7\right)\left(2a^2-a+8\right)$ is $\boxed{8a^4+2a^3+15a^2+31a-56}$

Answer 38PA.

Find the product $\left(6x^2-5x+2\right)\left(3x^2+2x+4\right)$

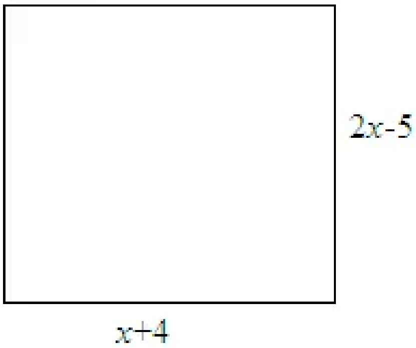
Apply distributive property to find the product and solve, therefore

$$
\begin{aligned}
&\left(6x^2-5x+2\right)\left(3x^2+2x+4\right) \\
&= 6x^2\left(3x^2+2x+4\right)-5x\left(3x^2+2x+4\right)+2\left(3x^2+2x+4\right) && \{\text{distributive property}\} \\
&= 6x^2\left(3x^2\right)+6x^2(2x)+6x^2(4)-5x\left(3x^2\right)-5x(2x)-5x(4)+2\left(3x^2\right)+2(2x)+2(4) && \{\text{distributive property}\} \\
&= 18x^4+12x^3+24x^2-15x^3-10x^2-20x+6x^2+4x+8 && \{\text{multiply}\} \\
&= 18x^4-3x^3+20x^2-16x+8 && \{\text{combine like terms}\}
\end{aligned}
$$

Hence the product of $\left(6x^2-5x+2\right)\left(3x^2+2x+4\right)$ is $\boxed{18x^4-3x^3+20x^2-16x+8}$

Answer 39PA.

According to the below figure, the length of the figure is $x+4$ and width is $2x-5$



Find an expression to represent the area of the figure.

The above figure forms a rectangle with length $x+4$ and width $2x-5$.

Now as you know that the area of a rectangle can be found by using the formula $A=l\times w$ where *A* is the area, *l* is the length and *w* is the breadth of the rectangle.

So substituting $l=x+4$ and $w=2x-5$ in the above formula of area, therefore

$$\begin{aligned} A &= l\times w \\ &= (x+4)\times(2x-5) \end{aligned}$$

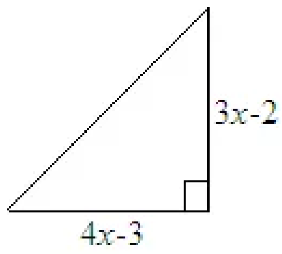
Apply distributive property to find the expression of the area, therefore

$$\begin{aligned} A &= (x+4)\times(2x-5) \\ &= x(2x-5)+4(2x-5) && \{\text{distributive property}\} \\ &= x(2x)+x(-5)+4(2x)+4(-5) && \{\text{distributive property}\} \\ &= 2x^2-5x+8x-20 && \{\text{multiply}\} \\ &= 2x^2+3x-20 && \{\text{combine like terms}\} \end{aligned}$$

Hence the expression for the area *A* of the figure is $\boxed{2x^2+3x-20 \text{ sq. units}}$

Answer 40PA.

According to the below figure, the height of the figure is $3x-2$ and base is $4x-3$



Find an expression to represent the area of the figure.

The above figure forms a right angle triangle with height $3x-2$ and base $4x-3$.

Now as you know that the area of a right angle triangle can be found by using the formula $A=\frac{1}{2}\times h\times b$ where *A* is the area, *h* is the height and *b* is the base of the triangle.

So substituting $h=3x-2$ and $b=4x-3$ in the above formula of area, therefore

$$\begin{aligned} A &= \frac{1}{2}\times h\times b \\ &= \frac{1}{2}\times(3x-2)\times(4x-3) \end{aligned}$$

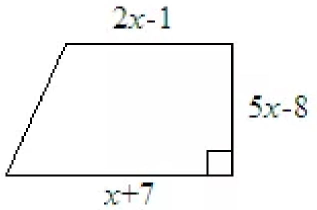
Apply distributive property to find the expression of the area, therefore

$$\begin{aligned} A &= \frac{1}{2}\times(3x-2)\times(4x-3) \\ &= \frac{1}{2}\times\left[3x(4x-3)-2(4x-3)\right] && \{\text{distributive property}\} \\ &= \frac{1}{2}\times\left[3x(4x)+3x(-3)-2(4x)-2(-3)\right] && \{\text{distributive property}\} \\ &= \frac{1}{2}\times\left[12x^2-9x-8x+6\right] && \{\text{multiply}\} \\ &= \frac{1}{2}\times\left[12x^2-17x+6\right] && \{\text{combine like terms}\} \\ &= \frac{12x^2}{2}-\frac{17x}{2}+\frac{6}{2} \\ &= 6x^2-\frac{17}{2}x+3 \end{aligned}$$

Hence the expression for the area *A* of the figure is $\boxed{6x^2-\frac{17}{2}x+3\text{ sq. units}}$

Answer 41PA.

According to the below figure, the bases of the figure are $2x-1$, $x+7$ and height of the figure is $5x-8$



Find an expression to represent the area of the figure.

The above figure forms a trapezoid with bases $2x-1$, $x+7$ and height $5x-8$

Now as you know that the area of a right angle triangle can be found by using the formula

$A=\frac{1}{2}\times(b_1+b_2)\times h$ where *A* is the area, b_1 is the one base and b_2 is the second base and *h* is the height of the trapezoid.

So substituting $b_1=2x-1$, $b_2=x+7$ and $h=5x-8$ in the above formula of area, therefore

$$\begin{aligned}A&=\frac{1}{2}\times(b_1+b_2)\times h\\&=\frac{1}{2}\times(2x-1+x+7)\times(5x-8)\\&=\frac{1}{2}(3x+6)(5x-8)\end{aligned}$$

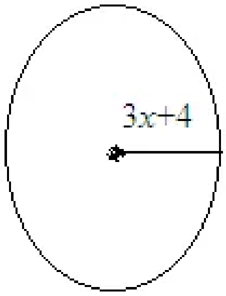
Apply distributive property to find the expression of the area, therefore

$$\begin{aligned}A&=\frac{1}{2}(3x+6)(5x-8)\\&=\frac{1}{2}\times[3x(5x-8)+6(5x-8)] && \{\text{distributive property}\}\\&=\frac{1}{2}\times[3x(5x)+3x(-8)+6(5x)+6(-8)] && \{\text{distributive property}\}\\&=\frac{1}{2}\times[15x^2-24x+30x-48] && \{\text{multiply}\}\\&=\frac{1}{2}\times[15x^2+6x-48] && \{\text{combine like terms}\}\\&=\frac{15x^2}{2}+\frac{6x}{2}-\frac{48}{2}\\&=\frac{15}{2}x^2+3x-24\end{aligned}$$

Hence the expression for the area *A* of the figure is $\boxed{\frac{15}{2}x^2+3x-24 \text{ sq. units}}$

Answer 42PA.

According to the below figure, radius of the circle is $3x+4$



Find an expression to represent the area of the figure.

Now as you know that the area of a circle can be found by using the formula $A=\pi r^2$ where *A* is the area, *r* is the radius of the circle.

So substituting $r=3x+4$ in the above formula of area, therefore

$$\begin{aligned}A&=\pi r^2\\&=\frac{22}{7}\times(3x+4)^2\\&=\frac{22}{7}(3x+4)(3x+4)\end{aligned}$$

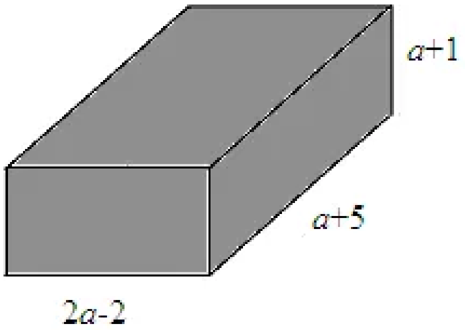
Apply distributive property to find the expression of the area, therefore

$$\begin{aligned}A&=\frac{22}{7}\times(3x+4)(3x+4)\\&=\frac{22}{7}\times[3x(3x+4)+4(3x+4)] && \{\text{distributive property}\}\\&=\frac{22}{7}\times[3x(3x)+3x(4)+4(3x)+4(4)] && \{\text{distributive property}\}\\&=\frac{22}{7}\times[9x^2+12xx+12x+16] && \{\text{multiply}\}\\&=\frac{22}{7}\times[9x^2+24x+16] && \{\text{combine like terms}\}\\&=\frac{198x^2}{7}+\frac{528x}{7}+\frac{352}{7}\\&=\frac{198}{7}x^2+\frac{528}{7}x+\frac{352}{7}\end{aligned}$$

Hence the expression for the area *A* of the figure is $\boxed{\frac{198}{7}x^2+\frac{528}{7}x+\frac{352}{7}\text{ sq. units}}$

Answer 43PA.

According to the below figure, the length of the prism is $a+5$, width of the prism is $2a-2$ and height is $a+1$



Find an expression to represent the volume of the prism.

According to the given condition, volume *V* of a prism equals the area of the base *B* times the height *h*.

Now the base of the prism is in the rectangular shape and the area of the rectangular figure can be found by using the formula $A = lw$ where *A* is the area, *l* is the length and *w* is the width of the rectangular figure.

Therefore from the above condition you will have

$V = (lw) \cdot h$ ...... (1)

Now Substituting $l = a+5$, $w = 2a-2$ and $h = a+1$ in the above equation (1), therefore

$$\begin{aligned} V &= (lw) \cdot h \\ &= [(a+5)(2a-2)] \cdot (a+1) \end{aligned}$$

Apply FOIL method to find the expression of the volume, therefore

$$\begin{aligned} V &= [(a+5)(2a-2)] \cdot (a+1) \\ &= [a(2a) + a(-2) + 5(2a) + 5(-2)] \cdot (a+1) \quad \{\text{FOIL method}\} \\ &= [2a^2 - 2a + 10a - 10] \cdot (a+1) \quad \{\text{multiply}\} \\ &= (2a^2 + 8a - 10) \cdot (a+1) \end{aligned}$$

Now applying distributive property and solve, therefore

$$V=\left(2a^2+8a-10\right)\cdot(a+1)$$
$$=a\left(2a^2+8a-10\right)+1\left(2a^2+8a-10\right) \quad \{\text{distributive property}\}$$
$$=a\left(2a^2\right)+a(8a)+a(-10)+1\left(2a^2\right)+1(8a)+1(-10) \quad \{\text{distributive property}\}$$
$$=2a^3+8a^2-10a+2a^2+8a-10 \quad \{\text{multiply}\}$$
$$=2a^3+10a^2-2a-10 \quad \{\text{combine like terms}\}$$

Hence the expression for the volume *V* of the figure is $\boxed{2a^3+10a^2-2a-10\text{ units}^3}$

Answer 44PA.

According to the given figure, there are two base of the prism.

Length of the first base b_1 is $2y$ and width is $3y$ and length of the second base b_2 is 6 and width is $3y$ and height of the prism is $7y+3$

Find an expression to represent the volume of the prism.

According to the given condition, volume *V* of a prism equals the area of the base *B* times the height *h*.

Therefore from the above condition you will have

$$V=\left(\text{area of base}b_1+\text{area of base}b_2\right)\cdot h$$

Now the bases of the prism is in the rectangular shape and the area of the rectangular figure can be found by using the formula $A=lw$ where *A* is the area, *l* is the length and *w* is the width of the rectangular figure.

$$V=\left(\text{area of base}b_1+\text{area of base}b_2\right)\cdot h$$
$$=\left[(l.w)+(l.w)\right]\cdot h$$

Substituting the given values in the above expression, therefore

$$V=\left[(l.w)+(l.w)\right]\cdot h$$
$$=\left[(3y\cdot 2y)+(6\cdot 3y)\right]\cdot(7y+3)$$
$$=\left(6y^2+18y\right)\cdot(7y+3)$$

Apply FOIL method to find the expression of the volume, therefore

$$V=\left(6y^2+18y\right)\cdot(7y+3)$$
$$=6y^2(7y)+6y^2(3)+18y(7y)+18(3) \quad \{\text{FOIL method}\}$$
$$=42y^3+18y^2+126y^2+54 \quad \{\text{multiply}\}$$
$$=42y^3+144y^2+54 \quad \{\text{combine like terms}\}$$

Hence the expression for the volume *V* of the figure is $\boxed{42y^3+144y^2+54\text{ units}^3}$

Answer 45PA.

Write a polynomial representation of the product of three consecutive integers.

According to the definition of the consecutive integers:- Consecutive integers are integers that follow each other in order and have a difference of 1 between every two numbers

Let the least integer be *a*. So, other two consecutive integers will be $a+1$ and $a+2$

The product of these three consecutive integers will be

$$\begin{aligned} a(a+1)(a+2) &= [a(a)+a(1)](a+2) \quad \{\text{distributive property}\} \\ &= (a^2+a)(a+2) \\ &= a(a^2+a)+2(a^2+a) \quad \{\text{distributive property}\} \\ &= a(a^2)+a(a)+2(a^2)+2(a) \end{aligned}$$

$$\begin{aligned} &= a^3+a^2+2a^2+2a \quad \{\text{multiply}\} \\ &= a^3+3a^2+2a \quad \{\text{combine like terms}\} \end{aligned}$$

Hence the polynomial representation of the product of three consecutive integers is

$\boxed{a^3+3a^2+2a}$

Answer 46PA.

Write a polynomial representation of the product of three consecutive integers.

According to the definition of the consecutive integers:- Consecutive integers are integers that follow each other in order and have a difference of 1 between every two numbers

Let us take an integer $a=1$. So, other two consecutive integers will be $a+1$ and $a+2$ that are $1+1=2$, $1+2=3$

The product of these three consecutive integers will be

$$\begin{aligned} a(a+1)(a+2) &= 1(1+1)(1+2) \\ &= 1(2)(3) \\ &= 6 \end{aligned}$$

Hence the product of three consecutive integers is $\boxed{6}$ when $a=1$

Answer 47PA.

In exercise 45, we found a polynomial a^3+3a^2+2a from the product of three consecutive integers $a, a+1$ and $a+2$.

Now evaluating above polynomial for $a=1$

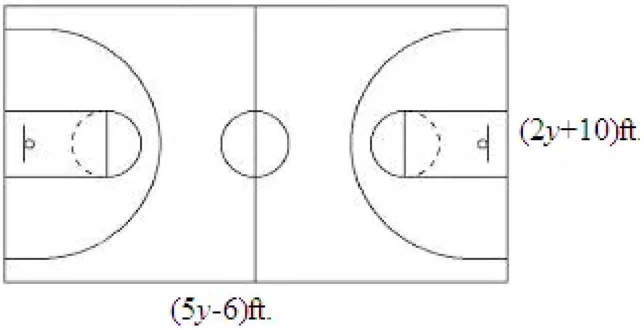
So, substitute $a=1$ in the polynomial a^3+3a^2+2a, therefore

$$\begin{aligned} a^3+3a^2+2a &= (1)^3+3(1)^2+2(1) \quad \{a=1\} \\ &= 1+3+1 \\ &= 6 \end{aligned}$$

The result on evaluating the polynomial a^3+3a^2+2a for $a=1$ is the same as the product of three consecutive integers for $a=1$ in exercise 46.

Answer 48PA.

The dimensions of a basketball court are represented by a width of $(2y+10)$ feet and a length of $(5y-6)$ feet which is shown as below



Find an expression for the area of the court.

The above court forms a rectangular shape and the area of the rectangular figure can be found by using the formula $A=lw$ where *A* is the area, *l* is the length and *w* is the width of the rectangular figure.

So substituting $l=5y-6$ and $w=2y+10$ in the above formula of area, therefore

$$\begin{aligned} A &= l\times w \\ &= (5y-6)\times(2y+10) \end{aligned}$$

Apply FOIL method to find the expression of the area, therefore

$$\begin{aligned} A &= (5y-6)\times(2y+10) \\ &= 5y(2y)+5y(10)-6(2y)-6(10) \quad \{\text{FOIL method}\} \\ &= 10y^2+50y-12y-60 \quad \{\text{multiply}\} \\ &= 10y^2+38y-60 \quad \{\text{combine like terms}\} \end{aligned}$$

Hence the expression for the area *A* of the basketball court is $\boxed{10y^2+38y-60 \text{ sq. feet}}$

Answer 49PA.

Let us suppose that dimension of the Latanya's office is *x* feet.

Now according to the given condition, her new office will be 2 feet shorter in one direction and 4 feet longer in the other directions.

Therefore the dimensions of the Latanya's new office will be $(x-2)$ feet and $(x+4)$ feet

Hence the expressions for the dimensions of Latanya's new office is

$\boxed{(x-2)\text{ feet and }(x+4)\text{ feet}}$

Answer 50PA.

The dimensions of the Latanya's new office are $(x-2)$ feet and $(x+4)$ feet which forms a rectangle.

And the area of the rectangular figure can be found by using the formula $A = lw$ where *A* is the area, *l* is the length and *w* is the width of the rectangular figure.

So substituting $l = x-2$ and $w = x+4$ in the above formula of area, therefore

$$\begin{aligned} A &= l \times w \\ &= (x-2)\times(x+4) \end{aligned}$$

Apply FOIL method to find the expression of the area, therefore

$$\begin{aligned} A &= (x-2)\times(x+4) \\ &= x(x)+x(4)-2(x)-2(4) && \{\text{FOIL method}\} \\ &= x^2+4x-2x-8 && \{\text{multiply}\} \\ &= x^2+2x-8 && \{\text{combine like terms}\} \end{aligned}$$

Hence the expression for the area *A* of her new office is $\boxed{(x^2+2x-8)\text{ sq. feet}}$

Answer 51PA.

Latanya's present office is a square having the dimension 9 feet by 9 feet.

So, the area of her present office is $9\times 9 = 81\,feet^2$ $\{\text{area of square} = \text{side}\times\text{side}\}$

Now her new office will be 2 feet shorter in one direction and 4 feet longer in the other direction.

So, the dimensions of her new office will be $(9-2)=7$ feet and $(9+4)=13$ feet

So, Latanya's new office will be a rectangle and the area of her new office will be $7\times 13 = 91\,feet^2$ $\{\text{area of rectangle} = l\times w\}$

Therefore her new office will be bigger than her old office by $(91-81)=10\text{ feet}^2$

Hence her new office will be $\boxed{\text{bigger}}$ than her old office by $\boxed{10\text{ sq.feet}}$

Answer 52PA.

a) Find the product $35(19)$ by using FOIL method.

Firstly write the above numbers as $(30+5)(20-1)$

Now apply FOIL method to find the product of the above numbers.

In FOIL method, you have to find the sum of the product of F-first terms, O-outer terms, I-inner terms and L-last terms.

So apply the FOIL method and solve therefore

$$\begin{aligned}35(19) &= (30+5)(20-1) \\ &= 30(20)+30(-1)+5(20)+5(-1) \quad \{\text{FOIL method}\} \\ &= 600-30+100-5 \quad \{\text{multiply}\} \\ &= 665\end{aligned}$$

Hence the product of $35(19)$ by using FOIL method is $\boxed{665}$

b) Find the product $67(102)$ by using FOIL method.

Firstly write the above numbers as $(70-3)(100+2)$

Now apply FOIL method to find the product of the above numbers.

In FOIL method, you have to find the sum of the product of F-first terms, O-outer terms, I-inner terms and L-last terms.

So apply the FOIL method and solve therefore

$$\begin{aligned}67(102) &= (70-3)(100+2) \\ &= 70(100)+70(2)-3(100)-3(2) \quad \{\text{FOIL method}\} \\ &= 7000+140-300-6 \quad \{\text{multiply}\} \\ &= 6834 \quad \{\text{add and subtract}\}\end{aligned}$$

Hence the product of $67(102)$ by using FOIL method is $\boxed{6834}$

c) Find the product $8\frac{1}{2}\cdot 6\frac{3}{4}$ by using FOIL method.

Firstly write the above numbers as $\frac{17}{2}\cdot\frac{27}{4}=\left(8+\frac{1}{2}\right)\left(6+\frac{3}{4}\right)$

Now apply FOIL method to find the product of the above numbers.

In FOIL method, you have to find the sum of the product of F-first terms, O-outer terms, I-inner terms and L-last terms.

So apply the FOIL method and solve therefore

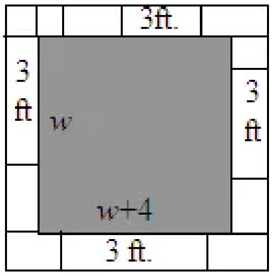
$$\begin{aligned}\left(8+\frac{1}{2}\right)\left(6+\frac{3}{4}\right)&=8(6)+8\left(\frac{3}{4}\right)+\frac{1}{2}(6)+\frac{1}{2}\left(\frac{3}{4}\right) && \{\text{FOIL method}\}\\ &=48+6+3+\frac{3}{8} && \{\text{multiply}\}\\ &=57+\frac{3}{8} && \{\text{add}\}\\ &=\frac{456+3}{8} && \{\text{L.C.M}=8\}\end{aligned}$$

$$=\frac{459}{8}$$

Hence the product of $8\frac{1}{2}\cdot 6\frac{3}{4}$ by using FOIL method is $\boxed{\frac{459}{8}}$

Answer 53PA.

According to the below figure, length of the swimming pool means internal rectangle is $(w+4)\ ft$ and width is w feet. So, length of the concrete pathway means length of the external rectangle will be $(w+4+3+3)=(w+10)\ ft$ and width of the rectangle will be $(w+3+3)=(w+6)\ ft$



You have to find the dimensions of the pool.

According to the given statement, homeowner can afford 300 square feet of concrete for the pathway. So to find the dimensions of the pool, you have to subtract the area of the pool from the area of the concrete walkway means from the area of the external rectangle and keep this equals to 300.

Therefore

$$\text{Area of external rectangle} - \text{Area of internal rectangle} = 300$$
$$(w+6)(w+10)-w(w+4)=300$$

Now apply FOIL method and solve

$$(w+6)(w+10)-w(w+4)=300$$
$$[w(w)+w(10)+6(w)+6(10)]-w(w)-w(4)=300 \quad \{\text{FOIL method}\}$$
$$w^2+10w+6w+60-w^2-4w=300 \quad \{\text{multiply}\}$$
$$12w+60=300 \quad \{\text{combine like terms}\}$$

$$12w=300-60 \quad \{\text{subtract 60 from each side}\}$$
$$12w=240$$
$$w=\frac{240}{12} \quad \{\text{divide each side by 12}\}$$
$$=20$$

Therefore length of the pool is $(w+4)=(20+4)\,ft$ and width is $w=20\,ft$

Hence dimensions of the pool are $\boxed{20\,ft \text{ and } 24\,ft}$

Answer 54PA.

The statement "The product of a binomial and a trinomial is a polynomial with four terms" is sometime true because if we take an example of a binomial $(2x+y)$ and a trinomial $(4x^2-2xy+4y^2)$ then the product of these binomial and trinomial having only three terms which is shown as below

$$(4x^2-2xy+4y^2)(2x+y)$$
$$=2x(4x^2-2xy+4y^2)+y(4x^2-2xy+4y^2) \quad \{\text{distributive property}\}$$
$$=2x(4x^2)+2x(-2xy)+2x(4y^2)+y(4x^2)+y(-2xy)+y(4y^2) \quad \{\text{distributive property}\}$$
$$=8x^3-4x^2y+8xy^2+4x^2y-2xy^2+4y^3 \quad \{\text{multiply}\}$$

$$=8x^3+6xy^2+4y^3 \quad \{\text{combine like terms}\}$$

And if we take an example of binomial $(3k+4)$ and a trinomial $(7k^2+2k-9)$ then the product of these binomial and trinomial having four terms which is shown as below

$$(3k+4)(7k^2+2k-9)$$
$$=3k(7k^2+2k-9)+4(7k^2+2k-9) \quad \{\text{distributive property}\}$$
$$=3k(7k^2)+3k(2k)+3k(-9)+4(7k^2)+4(2k)+4(-9) \quad \{\text{distributive property}\}$$
$$=21k^3+6k^2-27k+28k^2+8k-36 \quad \{\text{multiply}\}$$

$$=21k^3+34k^2-19k-36 \quad \{\text{combine like terms}\}$$

Hence the statement "The product of a binomial and a trinomial is a polynomial with four terms" is $\boxed{\text{sometime}}$ true

Answer 55PA.

Multiplying binomials and two digit numbers each involve the use of distributive property twice. Each procedure involves four multiplications and the addition of like terms which is shown as below

The product of two binomials is

$$
\begin{aligned}
&(3x+6)(5x-8) \\
&=3x(5x-8)+6(5x-8) && \{\text{distributive property}\} \\
&=3x(5x)+3x(-8)+6(5x)+6(-8) && \{\text{distributive property}\} \\
&=15x^2-24x+30x-48 && \{\text{4 multiplications}\} \\
&=15x^2+6x-48 && \{\text{combine like terms}\}
\end{aligned}
$$

And the product of two digits number is

$$
\begin{aligned}
24\times 36 &= (20+4)(30+6) \\
&=20(30+6)+4(30+6) && \{\text{distributive property}\} \\
&=20(30)+20(6)+4(30)+4(6) && \{\text{distributive property}\} \\
&=600+120+120+24 && \{\text{multiplication}\} \\
&=864 && \{\text{combine like terms}\}
\end{aligned}
$$

The like terms in vertical two-digit multiplication are digits with same place value.

Answer 56PA.

Firstly apply FOIL method on the expression $(x+2)(x-4)-(x+4)(x-2)$ and then solve, therefore

$$
\begin{aligned}
&(x+2)(x-4)-(x+4)(x-2) \\
&=[x(x)+x(-4)+2(x)+2(-4)]-[x(x)+x(-2)+4(x)+4(-2)] && \{\text{FOIL method}\} \\
&=[x^2-4x+2x-8]-[x^2-2x+4x-8] && \{\text{multiply}\} \\
&=x^2-4x+2x-8-x^2+2x-4x+8 \\
&=-4x && \{\text{combine like terms}\}
\end{aligned}
$$

So, $(x+2)(x-4)-(x+4)(x-2)=-4x$, this is option C

Hence option $\boxed{\text{C}}$ is correct.

Answer 57PA.

Firstly apply distributive property on the expression $(x-y)(x^2+xy+y^2)$ and then solve, therefore

$$\begin{aligned}&(x-y)(x^2+xy+y^2)\\&=x(x^2+xy+y^2)-y(x^2+xy+y^2) && \{\text{distributive property}\}\\&=x(x^2)+x(xy)+x(y^2)-y(x^2)-y(xy)-y(y^2) && \{\text{distributive property}\}\\&=x^3+x^2y+xy^2-yx^2-xy^2-y^3 && \{\text{multiply}\}\end{aligned}$$

$$=x^3-y^3 \quad \{\text{combine like terms}\}$$

So, $(x-y)(x^2+xy+y^2)=x^3-y^3$, this is option B

Hence option $\boxed{\text{B}}$ is correct.

Answer 58MYS.

Find the product $3d(4d^2-8d-15)$

To multiply $3d$ with $(4d^2-8d-15)$, firstly use the distributive property $a(b+c+d)=ab+ac+ad$, therefore

$$3d(4d^2-8d-15)=3d\cdot(4d^2)+3d\cdot(-8d)+3d\cdot(-15)$$

Now to solve the above expression, multiply coefficients and exponents separately and use product of powers property that is $a^m\times a^n=a^{m+n}$, therefore

$$\begin{aligned}3d(4d^2-8d-15)&=3d\cdot(4d^2)+3d\cdot(-8d)+3d\cdot(-15)\\&=3\times4\cdot d^2\cdot d+3\times(-8)\cdot d\times d+3\times(-15)\cdot d\\&=12\cdot d^{2+1}-24\cdot d^{1+1}-45\cdot d\\&=12d^3-24d^2-45d\end{aligned}$$

Hence the product of $3d(4d^2-8d-15)$ is $\boxed{12d^3-24d^2-45d}$

Answer 59MYS.

Find the product $-4y(7y^2-4y+3)$

To multiply $-4y$ with $(7y^2-4y+3)$, firstly use the distributive property $a(b+c+d)=ab+ac+ad$, therefore

$$-4y(7y^2-4y+3)=-4y\cdot(7y^2)-4y\cdot(-4y)-4y\cdot(3)$$

Now to solve the above expression, multiply coefficients and exponents separately and use product of powers property that is $a^m\times a^n=a^{m+n}$, therefore

$$\begin{aligned}-4y(7y^2-4y+3)&=-4y\cdot(7y^2)-4y\cdot(-4y)-4y\cdot(3)\\&=-4\times7\cdot y^2\cdot y-4\times(-4)\cdot y\times y-4\times3\cdot y\\&=-28\cdot y^{2+1}+16\cdot y^{1+1}-12\cdot y\\&=-28y^3+16y^2-12y\end{aligned}$$

Hence the product of $-4y(7y^2-4y+3)$ is $\boxed{-28y^3+16y^2-12y}$

Answer 60MYS.

Find the product $2m^2(5m^2-7m+8)$

To multiply $2m^2$ with $(5m^2-7m+8)$, firstly use the distributive property $a(b+c+d)=ab+ac+ad$, therefore

$$2m^2(5m^2-7m+8)=2m^2\cdot(5m^2)+2m^2\cdot(-7m)+2m^2\cdot(8)$$

Now to solve the above expression, multiply coefficients and exponents separately and use product of powers property that is $a^m\times a^n=a^{m+n}$, therefore

$$\begin{aligned}2m^2(5m^2-7m+8)&=2m^2\cdot(5m^2)+2m^2\cdot(-7m)+2m^2\cdot(8)\\&=2\times5\cdot m^2\cdot m^2+2\times(-7)\cdot m^2\times m+2\times8\cdot m^2\\&=10\cdot m^{2+2}-14\cdot m^{2+1}+16\cdot m^2\\&=10m^4-14m^3+16m^2\end{aligned}$$

Hence the product of $2m^2(5m^2-7m+8)$ is $\boxed{10m^4-14m^3+16m^2}$

Answer 61MYS.

Simplify $3x(2x-4)+6(5x^2+2x-7)$

To simplify $3x(2x-4)+6(5x^2+2x-7)$, firstly apply the distributive property, therefore

$$\begin{aligned}&3x(2x-4)+6(5x^2+2x-7)\\&=3x\cdot(2x)+3x\cdot(-4)+6\cdot(5x^2)+6\cdot(2x)+6\cdot(-7)\end{aligned}$$

Now using product of powers property that is $a^m \times a^n = a^{m+n}$, therefore

$$\begin{aligned}&=3x\cdot(2x)+3x\cdot(-4)+6\cdot(5x^2)+6\cdot(2x)+6\cdot(-7)\\&=3\times2\cdot x\times x+3\times(-4)\cdot x+6\times5\cdot x^2+6\times2\cdot x-42\\&=6\cdot x^{1+1}-12x+30\cdot x^2+12x-42\\&=6x^2-12x+30x^2+12x-42\end{aligned}$$

Combining like terms, therefore

$$\begin{aligned}&3x(2x-4)+6(5x^2+2x-7)\\&=6x^2-12x+30x^2+12x-42\\&=36x^2-42\end{aligned}$$

Hence the simplification of $3x(2x-4)+6(5x^2+2x-7)$ is $\boxed{36x^2-42}$

Answer 62MYS.

Simplify $4a(5a^2+2a-7)-3(2a^2-6a-9)$

To simplify $4a(5a^2+2a-7)-3(2a^2-6a-9)$, firstly apply the distributive property, therefore

$$\begin{aligned}&4a(5a^2+2a-7)-3(2a^2-6a-9)\\&=4a(5a^2)+4a(2a)+4a(-7)-3(2a^2)-3(-6a)-3(-9)\end{aligned}$$

Now using product of powers property that is $a^m \times a^n = a^{m+n}$, therefore

$$= 4a(5a^2) + 4a(2a) + 4a(-7) - 3(2a^2) - 3(-6a) - 3(-9)$$
$$= 4\times 5\cdot a\times a^2 + 4\times(2)\cdot a\times a + 4\times(-7)\cdot a - 3\times 2\cdot a^2 - 3\times(-6)\cdot a + 27$$
$$= 20\cdot a^{1+2} + 8a^2 - 28a - 6a^2 + 18a + 27$$
$$= 20a^3 + 8a^2 - 28a - 6a^2 + 18a + 27$$

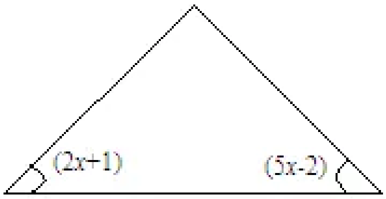
Combining like terms, therefore

$$4a(5a^2 + 2a - 7) - 3(2a^2 - 6a - 9)$$
$$= 20a^3 + 8a^2 - 28a - 6a^2 + 18a + 27$$
$$= 20a^3 + 2a^2 - 10a + 27$$

Hence the simplification of $4a(5a^2 + 2a - 7) - 3(2a^2 - 6a - 9)$ is $\boxed{20a^3 + 2a^2 - 10a + 27}$

Answer 63MYS.

According to the below triangle, one angle of the triangle is $(2x+1)^\circ$ and second angle is $(5x-2)^\circ$



Write the expression of the third angle of the triangle.

Let us suppose that θ is the third angle of the triangle.

Now as you know that the sum of all the angles of a triangle is always equal to 180°

Therefore

$$(2x+1) + (5x-2) + \theta = 180^\circ$$

Solve the above equation by combining the like terms, therefore

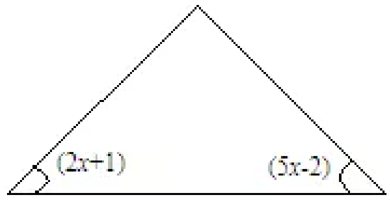
$$\begin{aligned}(2x+1)+(5x-2)+\theta &= 180^\circ \\ 7x-1+\theta &= 180^\circ && \{\text{combining like terms}\} \\ 7x+\theta &= 180^\circ+1 && \{\text{add 1 each side}\} \\ \theta &= 181^\circ-7x && \{\text{subtract } 7x \text{ from each side}\}\end{aligned}$$

So, the third angle of the triangle is $181^\circ - 7x$

Hence the expression to represent the measure of the third angle of the triangle is $\boxed{181^\circ - 7x}$

Answer 64MYS.

According to the below triangle, one angle of the triangle is $(2x+1)^\circ$ and second angle is $(5x-2)^\circ$



Now $x = 15$ is given. Find the measures of the three angles of the triangle.

To find the measure of the first angle, substitute $x = 15$ in the first angle that is $(2x+1)^\circ$

Therefore

$$\begin{aligned}(2x+1)^\circ &= (2(15)+1)^\circ \\ &= (30+1)^\circ \\ &= 31^\circ\end{aligned}$$

So, the measure of the first angle is 31°

Now to find the measure of the third angle, let us suppose that θ is the third angle of the triangle.

Now as you know that the sum of all the angles of a triangle is always equal to 180°

Therefore

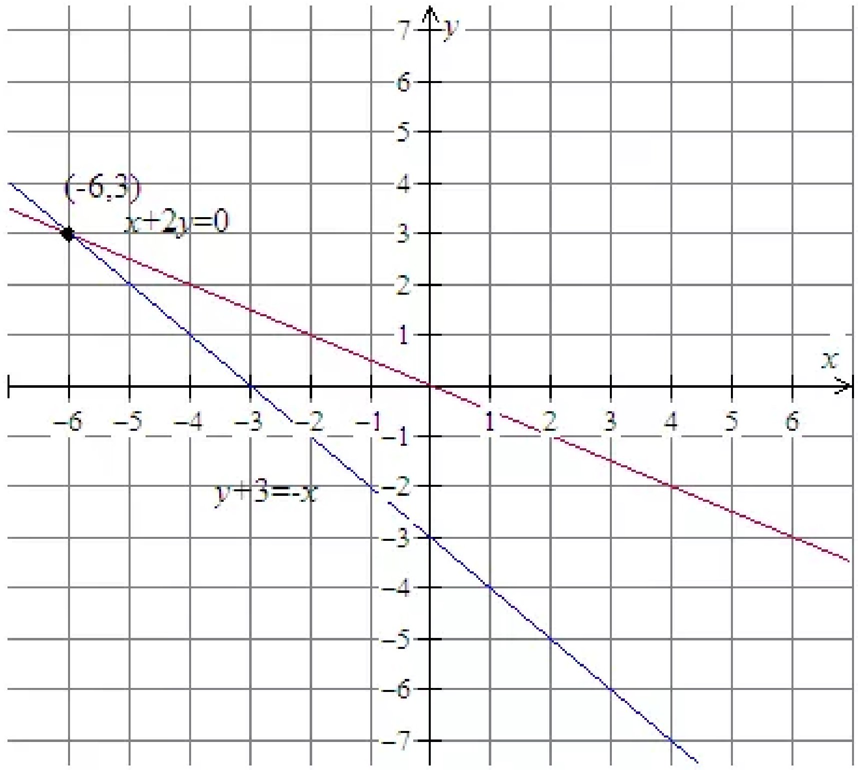
$$\begin{aligned}31^\circ+73^\circ+\theta &= 180^\circ && \{\text{first angle} = 31^\circ, \text{second angle} = 73^\circ\} \\ 104^\circ+\theta &= 180^\circ && \{\text{adding}\} \\ \theta &= 180^\circ-104^\circ && \{\text{subtract } 104^\circ \text{ from each side}\} \\ \theta &= 76^\circ\end{aligned}$$

Hence the measures of the three angles of the triangle is $\boxed{31^\circ, 73^\circ \text{ and } 76^\circ}$

Answer 65MYS.

If the graph of the equations intersects at exactly one point then there is only one solution, if the graph of the equations does not intersect, they are parallel then there are no solutions and if the graphs of the equations are same then there are infinite numbers of solutions.

Now according to the below graph of the equations $x+2y=0$ and $y+3=-x$, the graph of the equations intersects at exactly one point $(-6,3)$ therefore there is only one solution $(-6,3)$.



Hence by using the above graph, the system of equations has only $\boxed{\text{one}}$ solution that is $\boxed{(-6,3)}$

Answer 66MYS.

If $f(x)=2x-5$ and $g(x)=x^2+3x$ then find the value for $f(-4)$

To find the value of $f(-4)$, substitute $x=-4$ in the above equation $f(x)=2x-5$

Therefore

$$\begin{aligned} f(x) &= 2x-5 \\ f(-4) &= 2(-4)-5 \\ &= -8-5 \\ &= -13 \end{aligned}$$

Hence the value of $f(-4)$ is $\boxed{-13}$

Answer 67MYS.

If $f(x)=2x-5$ and $g(x)=x^2+3x$ then find the value of $g(-2)+7$

To find the value of $g(-2)+7$, firstly find $g(-2)$ by substituting $x=-2$ in the above equation $g(x)=x^2+3x$

Therefore

$$\begin{aligned} g(x)&=x^2+3x \\ g(-2)&=(-2)^2+3(-2) \\ &=4-6 \\ &=-2 \end{aligned}$$

So, the value of $g(-2)$ is -2

Now add 7 in the above value of $g(-2)$, therefore

$$\begin{aligned} g(-2)+7&=-2+7 \\ &=5 \end{aligned}$$

Hence the value of $g(-2)+7$ is $\boxed{5}$

Answer 68MYS.

If $f(x)=2x-5$ and $g(x)=x^2+3x$ then find the value for $f(-4)$

To find the value of $f(a+3)$, substitute $x=a+3$ in the above equation $f(x)=2x-5$

Therefore

$$\begin{aligned} f(x)&=2x-5 \\ f(a+3)&=2(a+3)-5 \\ &=2a+6-5 \\ &=2a+1 \end{aligned}$$

Hence the value of $f(a+3)$ is $\boxed{2a+1}$

Answer 69MYS.

Solve the equation $a=\frac{v}{t}$ for the variable *t*.

To solve for the variable *t*, firstly do cross multiplication and then solve for *t*, therefore

$$\begin{aligned} a&=\frac{v}{t} \\ at&=v \quad \{\text{cross multiplication}\} \\ t&=\frac{v}{a} \quad \{\text{divide each side by } a\} \end{aligned}$$

Hence the solution for the variable *t* is $\boxed{t=\frac{v}{a}}$

Answer 70MYS.

Solve the equation $ax - by = 2cz$ for the variable *y*.

To solve for the variable *y*, firstly subtract *ax* from each side of the equation and then solve for *y*, therefore

$$\begin{aligned} ax - by &= 2cz \\ -by &= 2cz - ax \quad \{\text{subtract } ax \text{ from each side}\} \\ y &= \frac{2cz - ax}{-b} \quad \{\text{divide each side by } -b\} \\ y &= \frac{-(ax - 2cz)}{-b} \end{aligned}$$

$$= \frac{ax - 2cz}{b}$$
$$= \frac{a}{b}x - \frac{2cz}{b}$$

Hence the solution for the variable *y* is $\boxed{y = \frac{a}{b}x - \frac{2cz}{b}}$

Answer 71MYS.

Solve the equation $4x + 3y = 7$ for the variable *y*.

To solve for the variable *y*, firstly subtract $4x$ from each side of the equation and then solve for *y*, therefore

$$\begin{aligned} 4x + 3y &= 7 \\ 3y &= 7 - 4x \quad \{\text{subtract } 4x \text{ from each side}\} \\ y &= \frac{7 - 4x}{3} \quad \{\text{divide each side by } 3\} \\ y &= \frac{7}{3} - \frac{4}{3}x \end{aligned}$$

Hence the solution for the variable *y* is $\boxed{y = \frac{7}{3} - \frac{4}{3}x}$

Answer 72MYS.

Simplify the given expression $(6a)^2$

In the above expression $(6a)^2$, 6*a* is the base and 2 is the power.

Now base is the product of two numbers so use product of a power rule which says that

If *a* & *b* are two real numbers and *n* is a integer then

$$(a.b)^n = a^n b^n$$

Now with the help of above rule, you will get

$$\begin{aligned} (6a)^2 &= 6^2 a^2 \\ &= (6 \times 6).a^2 \\ &= 36a^2 \end{aligned}$$

Hence the simplification of $(6a)^2$ is $\boxed{36a^2}$

Answer 73MYS.

Simplify the given expression $(7x)^2$

In the above expression $(7x)^2$, $7x$ is the base and 2 is the power.

Now base is the product of two numbers so use product of a power rule which says that

If *a* & *b* are two real numbers and *n* is a integer then

$$(a.b)^n = a^n b^n$$

Now with the help of above rule, you will get

$$\begin{aligned}(7x)^2 &= 7^2 x^2 \\ &= (7\times 7).x^2 \\ &= 49x^2\end{aligned}$$

Hence the simplification of $(7x)^2$ is $\boxed{49x^2}$

Answer 74MYS.

Simplify the given expression $(9b)^2$

In the above expression $(9b)^2$, $9b$ is the base and 2 is the power.

Now base is the product of two numbers so use product of a power rule which says that

If *a* & *b* are two real numbers and *n* is a integer then

$$(a.b)^n = a^n b^n$$

Now with the help of above rule, you will get

$$\begin{aligned}(9b)^2 &= 9^2 b^2 \\ &= (9\times 9).b^2 \\ &= 81b^2\end{aligned}$$

Hence the simplification of $(9b)^2$ is $\boxed{81b^2}$

Answer 75MYS.

Simplify the given expression $(4y^2)^2$

In the above expression $(4y^2)^2$, $4y^2$ is the base and 2 is the power.

Now base is the product of two numbers so use product of a power rule which says that

If *a* & *b* are two real numbers and *n* is a integer then

$$(a.b)^n = a^n b^n$$

Now with the help of above rule, you will get

$$\begin{aligned}(4y^2)^2 &= 4^2 (y^2)^2 \\ &= (4\times 4).(y^2)^2 \\ &= 16\cdot(y^2)^2\end{aligned}$$

Now there is an exponent expression containing a power is itself raised to a power, so use Power rule of exponential expression which states that:-

"If an exponential expression contains a power raised to a power then keep the base and multiply the powers".

For Example:-

If *a* is a real number and *m* & *n* are integers, then

$$\left(a^m\right)^n = a^{mn}$$

Now apply the above Power rule, therefore

$$\begin{aligned}\left(4y^2\right)^2 &= 16\cdot\left(y^2\right)^2\\ &= 16\cdot y^{2\cdot 2}\\ &= 16\cdot y^4\\ &= 16y^4\end{aligned}$$

Hence the simplification of $\left(4y^2\right)^2$ is $\boxed{16y^4}$

Answer 76MYS.

Simplify the given expression $\left(2v^3\right)^2$

In the above expression $\left(2v^3\right)^2$, $2v^3$ is the base and 2 is the power.

Now base is the product of two numbers so use product of a power rule which says that

If *a* & *b* are two real numbers and *n* is a integer then

$$\left(a.b\right)^n = a^n b^n$$

Now with the help of above rule, you will get

$$\begin{aligned}\left(2v^3\right)^2 &= 2^2\left(v^3\right)^2\\ &= \left(2\times 2\right).\left(v^3\right)^2\\ &= 4\cdot\left(v^3\right)^2\end{aligned}$$

Now there is an exponent expression containing a power is itself raised to a power, so use Power rule of exponential expression which states that:-

"If an exponential expression contains a power raised to a power then keep the base and multiply the powers".

For Example:-

If *a* is a real number and *m* & *n* are integers, then

$$\left(a^m\right)^n = a^{mn}$$

Now apply the above Power rule, therefore

$$\begin{aligned}\left(2v^3\right)^2 &= 4\cdot\left(v^3\right)^2 \\ &= 4\cdot v^{3\cdot 2} \\ &= 4\cdot v^6 \\ &= 4v^6\end{aligned}$$

Hence the simplification of $\left(2v^3\right)^2$ is $\boxed{4v^6}$

Answer 77MYS.

Simplify the given expression $\left(3g^4\right)^2$

In the above expression $\left(3g^4\right)^2$, $3g^4$ is the base and 2 is the power.

Now base is the product of two numbers so use product of a power rule which says that

If *a* & *b* are two real numbers and *n* is a integer then

$$(a.b)^n = a^n b^n$$

Now with the help of above rule, you will get

$$\begin{aligned}\left(3g^4\right)^2 &= 3^2\left(g^4\right)^2 \\ &= (3\times 3).\left(g^4\right)^2 \\ &= 9\cdot\left(g^4\right)^2\end{aligned}$$

Now there is an exponent expression containing a power is itself raised to a power, so use Power rule of exponential expression which states that:-

“If an exponential expression contains a power raised to a power then keep the base and multiply the powers”.

For Example:-

If *a* is a real number and *m* & *n* are integers, then

$$\left(a^m\right)^n = a^{mn}$$

Now apply the above Power rule, therefore

$$\begin{aligned}\left(3g^4\right)^2 &= 9\cdot\left(g^4\right)^2 \\ &= 9\cdot g^{4\cdot 2} \\ &= 9\cdot g^8 \\ &= 9g^8\end{aligned}$$

Hence the simplification of $\left(3g^4\right)^2$ is $\boxed{9g^8}$