Chapter 1. Language of Algebra

Ex. 1.5

Answer 1CU.

14503-1.5-1CU AID: 4754 | 21/11/2014

The distributive property is

$$a(b+c) = ab + ac$$

In distributive property, the numbers inside the parentheses are each multiplied by the numbers outside the parentheses and then the products are added. Thus, multiplication is distributed over addition.

That is why the distributive property is sometimes called the distributive property of multiplication over addition.

Answer 2CU.

The objective is to write an expression that has five terms, out of which three are like terms and one terms with a coefficient of 1.

Consider the following expression:

$$b^2 + 2a + 3a + 4a - c$$

The expression has five terms.

The variable parts of the three terms $2a, 3a, 4a$ are same. So, these are like terms in the expression.

The terms b^2 has the coefficient of 1.

Thus, the expression that has five terms, out of which three are like terms and one terms with a coefficient of 1 is $\boxed{b^2 + 2a + 3a + 4a - c}$.

Answer 3CU.

Ben has done mistake in the second row of his simplification. Ben has not added the term w^4 with   using distributive property. Ben forgot that w^4 is really $1 \cdot w^4$.

Thus, the simplification done by $\boxed{\text{Courtney}}$ is correct as she has followed the correct order of operations.

Answer 4CU.

Consider the expression $6(12-2)$.

The objective is to rewrite the expression using the Distributive property and to simplify the expression.

To simplify the expression, first use Distributive property.

$$6(12-2)$$

$$= 6 \cdot 12 - 6 \cdot 2 \quad \left[\text{Use Distributive property}: a(b-c) = ab - ac\right]$$

$$= 72 - 12 \quad [\text{Multiply}]$$

$$= 60 \quad [\text{Subtract}]$$

Therefore, $6(12-2) = \boxed{60}$.

Answer 5CU.

Consider the expression $2(4+t)$.

The objective is to rewrite the expression using the Distributive property and to simplify the expression.

To simplify the expression, first use Distributive property.

$$2(4+t)$$

$$= 2 \cdot 4 + 2 \cdot t \quad \left[\text{Use Distributive property}: a(b+c) = ab + ac\right]$$

$$= 8 + 2t \quad [\text{Multiply}]$$

Therefore, $2(4+t) = \boxed{8+2t}$.

Answer 6CU.

Consider the expression $(g-9)5$.

The objective is to rewrite the expression using the Distributive property and to simplify the expression.

To simplify the expression, first use Distributive property.

$$(g-9)5$$

$$= g \cdot 5 - 9 \cdot 5 \quad \left[\text{Use Distributive property}: (b-c)a = ba - ca\right]$$

$$= 5g - 45 \quad [\text{Multiply}]$$

Therefore, $(g-9)5 = \boxed{5g-45}$.

Answer 7CU.

Consider the product $16(102)$.

The objective is to rewrite the expression using the Distributive property and to simplify the expression.

To simplify the expression, rewrite 102 as $(100+2)$.

$16(102)$

$=16(100+2)$

$=16\cdot100+16\cdot2$ $\left[\text{Use Distributive property}: a(b+c)=ab+ac\right]$

$=1600+32$ [Multiply]

$=1632$ [Add]

Therefore, $16(102)=\boxed{1632}$.

Answer 8CU.

Consider the product $\left(3\dfrac{1}{17}\right)(17)$.

The objective is to rewrite the expression using the Distributive property and to simplify the expression.

To simplify the expression, rewrite $3\dfrac{1}{17}$ as $\left(3+\dfrac{1}{17}\right)$.

$\left(3\dfrac{1}{17}\right)(17)$

$=\left(3+\dfrac{1}{17}\right)(17)$ $\left[3\dfrac{1}{17}=3+\dfrac{1}{17}\right]$

$=3\cdot(17)+\dfrac{1}{17}\cdot(17)$ $\left[\text{Use Distributive property}: (b+c)a=ba+ca\right]$

$=51+1$ [Multiply]

$=52$ [Add]

Therefore, $\left(3\dfrac{1}{17}\right)(17)=\boxed{52}$.

Answer 9CU.

Consider the following expression:

$13m+m$

The objective is to simplify the expression.

To simplify the expression, use the Distributive property.

$13m+m$

$=(13+1)m$ $\left[\text{Use the Distributive property}:(b+c)a=ba+ca\right]$

$=14m$ [Perform addition inside parentheses]

Therefore, $13m+m=\boxed{14m}$.

Answer 10CU.

Consider the following expression:

$$3(x+2x)$$

The objective is to simplify the expression.

To simplify the expression, use the Distributive property.

$$3(x+2x)$$

$$=3\cdot x+3\cdot 2x \quad \left[\text{Use the Distributive property}: a(b+c)=ab+ac\right]$$

$$=3x+6x \quad \text{[Perform addition inside parentheses]}$$

$$=(3+6)x \quad \left[\text{Use the Distributive property}: (b+c)a=ba+ca\right]$$

$$=9x \quad \text{[Add]}$$

Therefore, $3(x+2x)=\boxed{9x}$.

Answer 11CU.

Consider the following expression:

$$14a^2+13b^2+27$$

The objective is to simplify the expression.

There are no like terms in the expression to combine. Moreover, the terms in the expression are already simplified. So, the expression can not be simplified further. Thus, the expression is already $\boxed{\text{simplified}}$.

Answer 12CU.

Consider the following expression:

$$4(3g+2)$$

The objective is to simplify the expression.

To simplify the expression, use the Distributive property.

$$4(3g+2)$$

$$=4\cdot 3g+4\cdot 2 \quad \left[\text{Use the Distributive property}: a(b+c)=ab+ac\right]$$

$$=12g+8 \quad \text{[Perform multiplication]}$$

Therefore, $4(3g+2)=\boxed{12g+8}$.

Answer 13CU.

Consider that the total number of haircuts given by Ms. Curry is 12.

The amount she earns from each haircut is $19.95.

The average tip she receives from each haircut is $2.

The objective is to find the expression to determine the total amount she earned.

The total amount she earns from each haircut is

$19.95 + $2
$= \$(19.95 + 2)$

The total amount she earns from 12 haircuts is

$= \$12(19.95 + 2)$

Thus, the expression to determine the total amount she earned is $\boxed{12(19.95 + 2)}$.

Answer 14CU.

Consider that the total number of haircuts given by Ms. Curry is 12.

The amount she earns from each haircut is $19.95.

The average tip she receives from each haircut is $2.

The objective is to determine the total amount she earned.

The total amount she earns from each haircut is

$19.95 + $2
$= \$(19.95 + 2)$

To find the total amount she earns from 12 haircuts, find

$12(19.95 + 2)$

$= 12 \cdot (19.95) + 12 \cdot 2$ $\left[\text{Use the Distributive property}: a(b + c) = ab + ac\right]$

$= 239.4 + 24$ [Multiply]

$= 263.4$ [Add]

Thus, the total amount she earned is $\boxed{\$263.4}$.

Answer 15PA.

Consider the expression $8(5 + 7)$.

The objective is to rewrite the expression using the Distributive property and to simplify the expression.

To simplify the expression, first use Distributive property.

$8(5 + 7)$

$= 8 \cdot 5 + 8 \cdot 7$ $\left[\text{Use Distributive property}: a(b + c) = ab + ac\right]$

$= 40 + 56$ [Multiply]

$= 96$ [Add]

Therefore, $8(5 + 7) = \boxed{96}$.

Answer 16PA.

Consider the expression $7(13+12)$.

The objective is to rewrite the expression using the Distributive property and to simplify the expression.

To simplify the expression, first use Distributive property.

$7(13+12)$

$= 7 \cdot 13 + 7 \cdot 12$ $\left[\text{Use Distributive property : } a(b+c) = ab + ac \right]$

$= 91 + 84$ [Multiply]

$= 175$ [Add]

Therefore, $7(13+12) = \boxed{175}$.

Answer 17PA.

Consider the expression $12(9-5)$.

The objective is to rewrite the expression using the Distributive property and to simplify the expression.

To simplify the expression, first use Distributive property.

$12(9-5)$

$= 12 \cdot 9 - 12 \cdot 5$ $\left[\text{Use Distributive property : } a(b-c) = ab - ac \right]$

$= 108 - 60$ [Multiply]

$= 48$ [Subtract]

Therefore, $12(9-5) = \boxed{48}$.

Answer 18PA.

Consider the expression $13(10-7)$.

The objective is to rewrite the expression using the Distributive property and to simplify the expression.

To simplify the expression, first use Distributive property.

$13(10-7)$

$= 13 \cdot 10 - 13 \cdot 7$ $\left[\text{Use Distributive property : } a(b-c) = ab - ac \right]$

$= 130 - 91$ [Multiply]

$= 39$ [Subtract]

Therefore, $13(10-7) = \boxed{39}$.

Answer 19PA.

Consider the expression $3(2x+6)$.

The objective is to rewrite the expression using the Distributive property and to simplify the expression.

To simplify the expression, first use Distributive property.

$3(2x+6)$

$= 3 \cdot 2x + 3 \cdot 6$ $\left[\text{Use Distributive property}: a(b+c) = ab + ac\right]$

$= 6x + 18$ [Multiply]

Therefore, $3(2x+6) = \boxed{6x+18}$.

Answer 20PA.

Consider the expression $8(3m+4)$.

The objective is to rewrite the expression using the Distributive property and to simplify the expression.

To simplify the expression, first use Distributive property.

$8(3m+4)$

$= 8 \cdot 3m + 8 \cdot 4$ $\left[\text{Use Distributive property}: a(b+c) = ab + ac\right]$

$= 24m + 32$ [Multiply]

Therefore, $8(3m+4) = \boxed{24m+32}$.

Answer 21PA.

Consider the expression $(4+x)2$.

The objective is to rewrite the expression using the Distributive property and to simplify the expression.

To simplify the expression, first use Distributive property.

$(4+x)2$

$= 4 \cdot 2 + x \cdot 2$ $\left[\text{Use Distributive property}: (b+c)a = ba + ca\right]$

$= 8 + 2x$ [Multiply]

Therefore, $(4+x)2 = \boxed{8+2x}$.

Answer 22PA.

Consider the expression $(5+n)3$.

The objective is to rewrite the expression using the Distributive property and to simplify the expression.

To simplify the expression, first use Distributive property.

$(5+n)3$

$= 5 \cdot 3 + n \cdot 3$ $\left[\text{Use Distributive property}: (b+c)a = ba + ca \right]$

$= 15 + 3n$ [Multiply]

Therefore, $(5+n)3 = \boxed{15+3n}$.

Answer 23PA.

Consider the expression $28\left(y - \dfrac{1}{7} \right)$.

The objective is to rewrite the expression using the Distributive property and to simplify the expression.

To simplify the expression, first use Distributive property.

$28\left(y - \dfrac{1}{7} \right)$

$= 28 \cdot y - 28 \cdot \dfrac{1}{7}$ $\left[\text{Use Distributive property}: a(b-c) = ab - ac \right]$

$= 28y - 4$ [Multiply]

Therefore, $28\left(y - \dfrac{1}{7} \right) = \boxed{28y - 4}$.

Answer 24PA.

Consider the expression $27\left(2b - \dfrac{1}{3} \right)$.

The objective is to rewrite the expression using the Distributive property and to simplify the expression.

To simplify the expression, first use Distributive property.

$27\left(2b - \dfrac{1}{3} \right)$

$= 27 \cdot 2b - 27 \cdot \dfrac{1}{3}$ $\left[\text{Use Distributive property}: a(b-c) = ab - ac \right]$

$= 54b - 9$ [Multiply]

Therefore, $27\left(2b - \dfrac{1}{3} \right) = \boxed{54b - 9}$.

Answer 25PA.

Consider the expression $a(b-6)$.

The objective is to rewrite the expression using the Distributive property and to simplify the expression.

To simplify the expression, first use Distributive property.

$a(b-6)$

$= a \cdot b - a \cdot 6$ $\left[\text{Use Distributive property}: a(b-c) = ab - ac \right]$

$= ab - 6a$ [Multiply]

Therefore, $a(b-6) = \boxed{ab - 6a}$.

Answer 26PA.

Consider the expression $x(z+3)$.

The objective is to rewrite the expression using the Distributive property and to simplify the expression.

To simplify the expression, first use Distributive property.

$x(z+3)$

$= x \cdot z + x \cdot 3$ $\left[\text{Use Distributive property}: a(b+c) = ab + ac \right]$

$= xz + 3x$ [Multiply]

Therefore, $x(z+3) = \boxed{xz + 3x}$.

Answer 27PA.

Consider the expression $2(a-3b+2c)$.

The objective is to rewrite the expression using the Distributive property and to simplify the expression.

To simplify the expression, first use Distributive property.

$2(a-3b+2c)$

$= 2 \cdot a + 2 \cdot (-3b) + 2 \cdot 2c$ $\left[\text{Use Distributive property}: a(b+c) = ab + ac \right]$

$= 2a - 6b + 4c$ [Multiply]

Therefore, $2(a-3b+2c) = \boxed{2a - 6b + 4c}$.

Answer 28PA.

Consider the expression $4(8p+4q-7r)$.

The objective is to rewrite the expression using the Distributive property and to simplify the expression.

To simplify the expression, first use Distributive property.

$4(8p+4q-7r)$

$= 4\cdot 8p + 4\cdot 4q + 4\cdot(-7r)$ $\left[\text{Use Distributive property}: a(b+c)=ab+ac\right]$

$= 32p+16q-28r$ [Multiply]

Therefore, $4(8p+4q-7r)=\boxed{32p+16q-28r}$.

Answer 29PA.

Consider that the total number of attendance on each day at Olympic Stadium is 110,000.

The total number of attendance on each day at aquatics center is 17,500.

The objective is to find an expression that can be used to determine the total number of people at Olympic Stadium and the aquatic center over 4 days.

The total number of people at Olympic Stadium and the aquatic center on each day is

$110,000+17,500$

The total number of people at Olympic Stadium and the aquatic center over 4 days is

$4(110,000+17,500)$

Thus, the expression to determine the total number of people at Olympic Stadium and the aquatic center over 4 days is $\boxed{4(110,000+17,500)}$.

Answer 30PA.

Consider that the total number of attendance on each day at Olympic Stadium is 110,000.

The total number of attendance on each day at aquatics center is 17,500.

The objective is to find the attendance for the 4-day period.

The total number of people at Olympic Stadium and the aquatic center on each day is

$110,000+17,500$

The total number of people at Olympic Stadium and the aquatic center over 4 days is

$4(110,000+17,500)$

To find the attendance for the 4-day period, simplify the expression $4(110,000+17,500)$.

$4(110,000+17,500)$

$= 4\cdot 110,000 + 4\cdot 17,500$ $\left[\text{Use the Distributive property}: a(b+c)=ab+ac\right]$

$= 440000 + 70000$ [Multiply]

$= 510,000$ [Add]

Thus, the total amount she earned is $\boxed{510,000}$.

Answer 31PA.

Consider the product $5 \cdot 97$.

The objective is to find the product using the Distributive property.

To find the product, rewrite 97 as $(100 - 3)$.

$5 \cdot 97$

$= 5 \cdot (100 - 3) \quad [97 = 100 - 3]$

$= 5 \cdot 100 - 5 \cdot 3 \quad [\text{Use Distributive property}: a(b-c) = ab - ac]$

$= 500 - 15 \quad [\text{Multiply}]$

$= 485 \quad [\text{Subtract}]$

Therefore, $5 \cdot 97 = \boxed{485}$.

Answer 32PA.

Consider the product $8 \cdot 990$.

The objective is to find the product using the Distributive property.

To find the product, rewrite 990 as $(1000 - 10)$.

$8 \cdot 990$

$= 8 \cdot (1000 - 10) \quad [990 = 1000 - 10]$

$= 8 \cdot 1000 - 8 \cdot 10 \quad [\text{Use Distributive property}: a(b-c) = ab - ac]$

$= 8000 - 80 \quad [\text{Multiply}]$

$= 7920 \quad [\text{Subtract}]$

Therefore, $8 \cdot 990 = \boxed{7920}$.

Answer 33PA.

Consider the product $17 \cdot 6$.

The objective is to find the product using the Distributive property.

To find the product, rewrite 6 as $(10 - 4)$.

$17 \cdot 6$

$= 17 \cdot (10 - 4) \quad [6 = 10 - 4]$

$= 17 \cdot 10 - 17 \cdot 4 \quad [\text{Use Distributive property}: a(b-c) = ab - ac]$

$= 170 - 68 \quad [\text{Multiply}]$

$= 102 \quad [\text{Subtract}]$

Therefore, $17 \cdot 6 = \boxed{102}$.

Answer 34PA.

Consider the product $24 \cdot 7$.

The objective is to find the product using the Distributive property.

To find the product, rewrite 7 as $(10-3)$.

$24 \cdot 7$

$= 24 \cdot (10-3) \quad [7 = 10-3]$

$= 24 \cdot 10 - 24 \cdot 3 \quad [\text{Use Distributive property}: a(b-c) = ab - ac]$

$= 240 - 72 \quad [\text{Multiply}]$

$= 168 \quad [\text{Subtract}]$

Therefore, $24 \cdot 7 = \boxed{168}$.

Answer 35PA.

Consider the product $18\left(2\dfrac{1}{9}\right)$.

The objective is to find the product using the Distributive property.

To find the product, rewrite $2\dfrac{1}{9}$ as $2 + \dfrac{1}{9}$.

$18\left(2\dfrac{1}{9}\right)$

$= 18\left(2 + \dfrac{1}{9}\right) \quad \left[2\dfrac{1}{9} = 2 + \dfrac{1}{9}\right]$

$= 18 \cdot 2 + 18 \cdot \dfrac{1}{9} \quad \left[\text{Use Distributive property}: a(b+c) = ab + ac\right]$

$= 36 + 2 \quad [\text{Multiply}]$

$= 38 \quad [\text{Add}]$

Therefore, $18\left(2\dfrac{1}{9}\right) = \boxed{38}$.

Answer 36PA.

Consider the product $48\left(3\dfrac{1}{6}\right)$.

The objective is to find the product using the Distributive property.

To find the product, rewrite $3\dfrac{1}{6}$ as $3+\dfrac{1}{6}$.

$48\left(3\dfrac{1}{6}\right)$

$=48\left(3+\dfrac{1}{6}\right)\quad\left[3\dfrac{1}{6}=3+\dfrac{1}{6}\right]$

$=48\cdot3+48\cdot\dfrac{1}{6}\quad\left[\text{Use Distributive property}:\ a(b+c)=ab+ac\right]$

$=144+8$ [Multiply]

$=152$ [Add]

Therefore, $48\left(3\dfrac{1}{6}\right)=\boxed{152}$.

Answer 37PA.

The number of hours spent by the public relations consultant on these activities on a typical week is

$5+12+18$

To find the total number of hours spent by the public relations consultant on these activities over the next 12 weeks, multiply $(5+12+18)$ by 12.

Thus, the expression that can be used to predict the number of hours she will spend on these activities over the next 12 weeks is $\boxed{12(5+12+18)}$.

Answer 38PA.

The number of hours spent by the public relations consultant on these activities on a typical week is

$5+12+18$

To find the total number of hours spent by the public relations consultant on these activities over the next 12 weeks, multiply $(5+12+18)$ by 12.

$12(5+12+18)$

$=12(35)$ [Add]

$=420$ [Multiply]

Thus, the number of hours she should plan for contacting people over the next 12 weeks is $\boxed{420\ \text{hours}}$.

Answer 39PA.

The cost of medical, dental, and vision insurance for an employee for 1 month is

$78 + $20 + $12

The cost of medical, dental, and vision insurance for an employee for 6 months is

6($78 + $20 + $12)

Thus, the expression that could be used to calculate the cost of medical, dental, and vision insurance for an employee for 6 months is $\boxed{6(78 + 20 + 12)}$.

Answer 40PA.

The cost of medical, dental, and vision insurance for an employee for 1 month is

$78 + $20 + $12

The cost of medical, dental, and vision insurance for an employee for 6 months is

6($78 + $20 + $12)

= $6(78 + 20 + 12)

= $6(110) [Add]

= $660 [Multiply]

Therefore, the cost of medical, dental, and vision insurance for an employee for 6 months is $\boxed{\$660}$.

Q4 41PA.

The cost of medical and dental insurance for an employee and his family for 1 month is

$78 + $20 + $50 + $15

The cost of medical and dental insurance for an employee and his family for 1 year or 12 months is

12($78 + $20 + $50 + $15)

= $12(78 + 20 + 50 + 15)

= $12(163) [Add]

= $1956 [Multiply]

Therefore, the cost of medical and dental insurance for an employee and his family for 1 year is $\boxed{\$1956}$.

Answer 42PA.

Consider the following expression:

$$2x+9x$$

The objective is to simplify the expression.

To simplify the expression, use the Distributive property.

$$2x+9x$$

$$=(2+9)x \quad \left[\text{Use the Distributive property}: (b+c)a=ba+ca\right]$$

$=11x$ [Perform addition inside parentheses]

Therefore, $2x+9x = \boxed{11x}$.

Answer 43PA.

Consider the following expression:

$$4b+5b$$

The objective is to simplify the expression.

To simplify the expression, use the Distributive property.

$$4b+5b$$

$$=(4+5)b \quad \left[\text{Use the Distributive property}: (b+c)a=ba+ca\right]$$

$=9b$ [Perform addition inside parentheses]

Therefore, $4b+5b = \boxed{9b}$.

Answer 44PA.

Consider the following expression:

$$5n^2+7n$$

The objective is to simplify the expression.

There are no like terms in the expression to combine. Moreover, the terms in the expression are already simplified. So, the expression can not be simplified further. Thus, the expression is already $\boxed{\text{simplified}}$.

Answer 45PA.

Consider the following expression:

$$3a^2 + 14a^2$$

The objective is to simplify the expression.

To simplify the expression, use the Distributive property.

$$3a^2 + 14a^2$$

$$= (3+14)a^2 \quad [\text{Use the Distributive property} : (b+c)a = ba + ca]$$

$$= 17a^2 \quad [\text{Perform addition inside parentheses}]$$

Therefore, $3a^2 + 14a^2 = \boxed{17a^2}$.

Answer 46PA.

Consider the following expression:

$$12(3c+4)$$

The objective is to simplify the expression.

To simplify the expression, use the Distributive property.

$$12(3c+4)$$

$$= 12 \cdot 3c + 12 \cdot 4 \quad [\text{Use the Distributive property} : a(b+c) = ab + ac]$$

$$= 36c + 48 \quad [\text{Perform multiplication}]$$

Therefore, $12(3c+4) = \boxed{36c+48}$.

Answer 47PA.

Consider the following expression:

$$15(3x-5)$$

The objective is to simplify the expression.

To simplify the expression, use the Distributive property.

$$15(3x-5)$$

$$= 15 \cdot 3x - 15 \cdot 5 \quad [\text{Use the Distributive property} : a(b-c) = ab - ac]$$

$$= 45x - 75 \quad [\text{Perform multiplication}]$$

Therefore, $15(3x-5) = \boxed{45x-75}$.

Answer 48PA.

Consider the following expression:

$$6x^2 + 14x - 9x$$

The objective is to simplify the expression.

To simplify the expression, use the Distributive property.

$$6x^2 + 14x - 9x$$

$$= 6x^2 + (14 - 9)x \quad \left[\text{Use the Distributive property} : (b - c)a = ba - ca\right]$$

$$= 6x^2 + 5x \quad \text{[Perform subtraction]}$$

Therefore, $6x^2 + 14x - 9x = \boxed{6x^2 + 5x}$.

Answer 49PA.

Consider the following expression:

$$4y^3 + 3y^3 + y^4$$

The objective is to simplify the expression.

To simplify the expression, use the Distributive property.

$$4y^3 + 3y^3 + y^4$$

$$= (4 + 3)y^3 + y^4 \quad \left[\text{Use the Distributive property} : (b + c)a = ba + ca\right]$$

$$= 7y^3 + y^4 \quad \text{[Perform subtraction]}$$

Therefore, $4y^3 + 3y^3 + y^4 = \boxed{7y^3 + y^4}$.

Answer 50PA.

Consider the following expression:

$$6(5a + 3b - 2b)$$

The objective is to simplify the expression.

To simplify the expression, use the Distributive property.

$$6(5a + 3b - 2b)$$

$$= 6\left[5a + (3 - 2)b\right] \quad \left[\text{Use the Distributive property} : (b - c)a = ba - ca\right]$$

$$= 6(5a + b) \quad \text{[Perform subtraction]}$$

$$= 6 \cdot 5a + 6 \cdot b \quad \left[\text{Use the Distributive property} : a(b + c) = ab + ac\right]$$

$$= 30a + 6b \quad \text{[Multiply]}$$

Therefore, $6(5a + 3b - 2b) = \boxed{30a + 6b}$.

Answer 51PA.

Consider the following expression:

$$5(6m + 4n - 3n)$$

The objective is to simplify the expression.

To simplify the expression, use the Distributive property.

$$5(6m + 4n - 3n)$$

$$= 5\left[6m + (4-3)n\right] \quad \left[\text{Use the Distributive property} : (b-c)a = ba - ca\right]$$

$$= 5(6m + n) \quad \text{[Perform subtraction]}$$

$$= 5 \cdot 6m + 5 \cdot n \quad \left[\text{Use the Distributive property} : a(b+c) = ab + ac\right]$$

$$= 30m + 5n \quad \text{[Multiply]}$$

Therefore, $5(6m + 4n - 3n) = \boxed{30m + 5n}$.

Answer 52PA.

Consider the following expression:

$$x^2 + \frac{7}{8}x - \frac{x}{8}$$

The objective is to simplify the expression.

To simplify the expression, use the Distributive property.

$$x^2 + \frac{7}{8}x - \frac{x}{8}$$

$$= x^2 + \left(\frac{7}{8} - \frac{1}{8}\right)x \quad \left[\text{Use the Distributive property} : (b-c)a = ba - ca\right]$$

$$= x^2 + \left(\frac{7-1}{8}\right)x \quad \text{[Perform subtraction]}$$

$$= x^2 + \left(\frac{6}{8}\right)x$$

$$= x^2 + \frac{3}{4}x \quad \text{[Simplify]}$$

Therefore, $x^2 + \frac{7}{8}x - \frac{x}{8} = \boxed{x^2 + \frac{3}{4}x}$.

Answer 53PA.

Consider the following expression:

$$a + \frac{a}{5} + \frac{2}{5}a$$

The objective is to simplify the expression.

To simplify the expression, use the Distributive property.

$$a + \frac{a}{5} + \frac{2}{5}a$$

$$= \left(1 + \frac{1}{5} + \frac{2}{5}\right)a \quad \left[\text{Use the Distributive property}: (b+c)a = ba + ca\right]$$

$$= \left(\frac{5+1+2}{5}\right)a \quad \text{[Perform addition]}$$

$$= \frac{8}{5}a \quad \text{[Simplify]}$$

Therefore, $a + \dfrac{a}{5} + \dfrac{2}{5}a = \boxed{\dfrac{8}{5}a}$.

Answer 56PA.

Consider the following expression:

$$3(x+y) + 2(x+y) - 4x$$

The objective is to simplify the expression.

To simplify the expression, use the Distributive property.

$$3(x+y) + 2(x+y) - 4x$$

$$= 3x + 3y + 2x + 2y - 4x \quad \left[\text{Use the Distributive property}: a(b+c) = ab + ac\right]$$

$$= 3x + 2x - 4x + 2y + 3y \quad \text{[Rearrange the terms]}$$

$$= (3+2-4)x + (2+3)y \quad \left[\text{Use the Distributive property}: (b+c)a = ba + ca\right]$$

$$= x + 5y \quad \text{[Simplify]}$$

Therefore, $3(x+y) + 2(x+y) - 4x = \boxed{x + 5y}$.

Answer 57PA.

Consider that

$$a = 2.8$$
$$b = 4.2$$

The objective is to find the value of c in the equation $c = 7(2a + 3b)$.

Substitute $a = 2.8$ and $b = 4.2$ in the equation.

$$c = 7(2 \cdot 2.8 + 3 \cdot 4.2)$$

$$= 7(5.6 + 12.6) \text{ [Multiply]}$$

$$= 7(18.2) \text{ [Add]}$$

$$= 127.4 \text{ [Multiply]}$$

Therefore, $c = 127.4$.

Thus, the correct option for the value of c is $\boxed{C}$.

Answer 58MYS.

Consider the following statement:

"If $7 \cdot 2 = 14$, then $14 = 7 \cdot 2$."

The objective is to name the property illustrated by the statement.

The symmetric property says that if $a = b$, then $b = a$.

Thus, the property illustrated by the above statement is $\boxed{\text{symmetric property}}$.

Answer 59MYS.

Consider the following equation:

$$8 + (3 + 9) = 8 + 12$$

The objective is to name the property illustrated by the equation.

The Substitution property says that if $a = b$, then a may be substituted for b.

In the above statement, 12 is substituted for $3 + 9$ as $3 + 9 = 12$.

Thus, the property illustrated by the above equation is $\boxed{\text{substitution property}}$.

Answer 60MYS.

Consider the following equation:

$$mnp = 1mnp$$

The objective is to name the property illustrated by the equation.

The multiplicative identity property says that for any real number a,

$$a \cdot 1 = a$$

Here 1 is called the multiplicative identity.

Thus, the property illustrated by the above equation is $\boxed{\text{multiplicative identity property}}$.

Answer 61MYS.

Consider the following equation:

$$3\left(5^2 \cdot \frac{1}{25}\right) = 3 \cdot 1$$

The objective is to name the property illustrated by the equation.

The multiplicative inverse property says that for any real number a $(a \neq 0)$,

$$a \cdot \frac{1}{a} = 1$$

where 1 is called the multiplicative identity and a and $\dfrac{1}{a}$ are multiplicative inverse of each other.

In the above statement $5^2 = 25$ and $\dfrac{1}{25}$ are multiplicative inverse of each other and so

$$5^2 \cdot \frac{1}{25} = 25 \cdot \frac{1}{25}$$
$$= 1$$

Thus, the property illustrated by the above equation is $\boxed{\text{multiplicative inverse property}}$.

Answer 62MYS.

In the above statement,

$$\frac{4}{3} = \frac{1}{\frac{3}{4}}$$

Thus, $\frac{4}{3}$ and $\frac{3}{4}$ are multiplicative inverse of each other and so

$$\left(\frac{3}{4}\right)\left(\frac{4}{3}\right) = 1$$

Thus, the property illustrated by the above equation is $\boxed{\text{multiplicative inverse property}}$.

Answer 63MYS.

Consider the following equation:

$$32 + 21 = 32 + 21$$

The objective is to name the property illustrated by the equation.

The reflexive property of real numbers says that for any real number a and b,

$$a + b = a + b$$

Thus, the property illustrated by the above equation is $\boxed{\text{reflexive property}}$.

Answer 64MYS.

Consider that sound travels 1129 feet per second through air.

The objective is to write an equation that represents the number of feet sound can travel in 2 seconds through air.

Let y represents the number of feet sound can travel through air.

To find the number of feet sound travels through air in 2 seconds, multiply 1129 by 2, that is,

$$2 \cdot (1129).$$

Thus, the equation that represents the number of feet sound can travel in 2 seconds through air is $\boxed{y = 2 \cdot (1129)}$.

Answer 65MYS.

Consider that sound travels 1129 feet per second through air.

The objective is to find the distance that sound can travel in 2 seconds through air.

To find the number of feet sound travels through air in 2 seconds, multiply 1129 by 2.

$$2 \cdot (1129)$$

$$= 2258 \text{ [Multiply]}$$

Thus, the distance that sound can travel in 2 seconds through air is $\boxed{2258 \text{ feet}}$.

Answer 66MYS.

To evaluate the expression, substitute $a = 4, b = 6$ and $c = 3$ in the expression.

$$3ab - c^2 = 3(4)(6) - 3^2$$

$$= 3(4)(6) - 9 \text{ [Evaluate the power]}$$

$$= 72 - 9 \text{ [Perform multiplication]}$$

$$= 63 \text{ [Perform subtraction]}$$

Therefore, the value of the expression is $\boxed{63}$.

Answer 67MYS.

To evaluate the expression, substitute $a = 4$ and $c = 3$ in the expression.

$$8(a - c)^2 + 3 = 8(4 - 3)^2 + 3$$

$$= 8(1)^2 + 3 \text{ [Perform subtraction]}$$

$$= 8 \cdot 1 + 3 \text{ [Evaluate the power]}$$

$$= 8 + 3 \text{ [Perform multiplication]}$$

$$= 11 \text{ [Perform addition]}$$

Therefore, the value of the expression is $\boxed{11}$.

Answer 68MYS.

To evaluate the expression, substitute $a = 4, b = 6$ and $c = 3$ in the expression.

$$\frac{6ab}{c(a+2)} = \frac{6(4)(6)}{3(4+2)}$$

$$= \frac{6(24)}{3(6)} \text{ [Perform multiplication in numerator and addition in denominator]}$$

$$= \frac{144}{18} \text{ [Perform multiplication]}$$

$$= 8 \text{ [Perform division]}$$

Therefore, the value of the expression is $\boxed{8}$.

Answer 69MYS.

To evaluate the expression, substitute $a = 4, b = 6$ and $c = 3$ in the expression.

$$(a+c)\left(\frac{a+b}{2}\right) = (4+3)\left(\frac{4+6}{2}\right)$$

$$= (7)\left(\frac{10}{2}\right) \text{ [Perform addition inside parentheses]}$$

$$= (7)(5) \text{ [Perform division inside parentheses]}$$

$$= 35 \text{ [Perform multiplication]}$$

Therefore, the value of the expression is $\boxed{35}$.

Answer 70MYS.

The objective is to find the area of the figure.

The figure is a rectangle with length 9 in. and width 5 in.

The area of a rectangle with length l and width w is

$$\text{Area} = lw \quad \cdots\cdots (1)$$

To find the area of the rectangle, substitute $l = 9$ and $w = 5$ in (1).

$$\text{Area} = 9 \cdot 5$$

$$= 45$$

Therefore, the area of the figure is $\boxed{45 \text{ in.}^2}$.

Answer 71MYS.

The objective is to find the area of the figure.

The figure is a triangle with base 24 cm and altitude 14 cm.

The area of a triangle with base b and altitude h is

$$\text{Area} = \frac{1}{2}(\text{Base})(\text{Altitude}) \quad \cdots\cdots (1)$$

The base and altitude of the right triangle are

$$\text{Base} = 24 \text{ cm}$$

$$\text{Altitude} = 14 \text{ cm}$$

To find the area, substitute Base $= 24,$ Altitude $= 14$ in (1).

$$\text{Area} = \frac{1}{2}(24)(14)$$

$$= (12)(14) \quad \text{[Divide]}$$

$$= 168 \quad \text{[Multiply]}$$

Therefore, the area of the triangle is $\boxed{168 \text{ cm}^2}$.

Answer 72MYS.

The objective is to find the area of the figure.

The figure is a square with a side of 8.5 m.

The area of a square with side h is

$$\text{Area} = h^2 \quad \cdots\cdots (1)$$

To find the area, substitute $h = 8.5$ in (1).

$$\text{Area} = (8.5)^2$$

$$= 72.25 \quad \text{[Evaluate the power]}$$

Therefore, the area of the square is $\boxed{72.25 \text{ m}^2}$.