Chapter 1. Language of Algebra

Ex. 1.6

Answer 1CU.

According to the associative property, for any three real numbers *a*, *b*, and *c*,

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

The associative property says that the way you group numbers together when adding or multiplying does not change the result.

For example,

$$2+(3+7)=(2+3)+7$$

Answer 1PQ10.

2.

The statement is:

$$(18-7)6=11(6)$$

The property used in the statement is Substitution property of equality.

Thus the correct option for the property used in the statement is $\boxed{c}$.

3.

The statement is:

$$24+15=15+24$$

The property used in the statement is Commutative property.

Thus the correct option for the property used in the statement is $\boxed{i}$.

4.

The statement is:

$$8 \cdot 5 = 8 \cdot 5$$

The property used in the statement is Reflexive property of equality.

Thus the correct option for the property used in the statement is $\boxed{\text{f}}$.

5.

The statement is:

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

The property used in the statement is Associative property.

Thus the correct option for the property used in the statement is $\boxed{\text{g}}$.

6.

The statement is:

$$1(57) = 57$$

The property used in the statement is Multiplicative identity property.

Thus the correct option for the property used in the statement is $\boxed{\text{d}}$.

7.

The statement is:

$$14 \cdot 0 = 0$$

The property used in the statement is Multiplicative property of 0.

Thus the correct option for the property used in the statement is $\boxed{\text{b}}$.

8.

The statement is:

$$3(13+10) = 3(13)+3(10)$$

The property used in the statement is Distributive property.

Thus the correct option for the property used in the statement is $\boxed{\text{a}}$.

9.

The statement is:

If $12+4=16$, then $16=12+4$.

The property used in the statement is Symmetric property of equality.

Thus the correct option for the property used in the statement is $\boxed{\text{h}}$.

10.

The statement is:

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

The property used in the statement is Multiplicative inverse property.

Thus the correct option for the property used in the statement is $\boxed{\text{e}}$.

Answer 2CU.

The commutative property says that the order in which you add or multiply numbers does not change their sum or product.

Commutative property is not applicable for division.

For example,

$$2\div 4=\frac{1}{2}$$

And

$$4\div 2=2$$

As $\frac{1}{2}\neq 2$,

$$2\div 4\neq 4\div 2$$

Thus, there is no commutative property of division.

Answer 3CU.

According to the associative property of multiplication, for any three real numbers *a*, *b*, and *c*,

$$\text{a}(b\cdot c)=(a\cdot b)c$$

The example for associative property of multiplication using the numbers 1, 5, and 8 is

$$\boxed{1(5\cdot 8)=(1\cdot 5)8}$$

Answer 4CU.

The objective is to evaluate the expression $14+18+26$.

To evaluate the expression, use the Associative property $a+(b+c)=(a+b)+c$.

$14+18+26$

$=(14+18)+26$ [Use the Associative property]

$=32+26$ [Use Substitution property; if $a=b$, then *a* may be substituted for *b*]

$=58$ [Use Substitution property]

Therefore, $14+18+26=\boxed{58}$.

Answer 5CU.

The objective is to evaluate the expression $3\frac{1}{2}+4+2\frac{1}{2}$.

To evaluate the expression, break the mix fractions first.

$3\frac{1}{2}+4+2\frac{1}{2}$

$=3+\frac{1}{2}+4+2+\frac{1}{2}$ $\left[3\frac{1}{2}=3+\frac{1}{2}\right]$

$=3+4+2+\frac{1}{2}+\frac{1}{2}$ [Use Commutative property: $a+b=b+a$]

$=7+2+\left(\frac{1}{2}+\frac{1}{2}\right)$ [Use Substitution property; if $a=b$, then *a* may be substituted for *b*]

$=7+2+1$ [Use Substitution property; $\frac{1}{2}+\frac{1}{2}=1$]

$=10$ [Use Substitution property]

Therefore, $3\frac{1}{2}+4+2\frac{1}{2}=\boxed{10}$.

Answer 6CU.

The objective is to evaluate the expression $5\cdot3\cdot6\cdot4$.

To evaluate the expression, perform multiplication from left side.

$5\cdot3\cdot6\cdot4$

$=15\cdot6\cdot4$ [Use Substitution property; if $a=b$, then *a* may be substituted for *b*; $5\cdot3=15$]

$=90\cdot4$ [Use Substitution property; $15\cdot6=90$]

$=360$ [Use Substitution property; $90\cdot4=360$]

Therefore, $5\cdot3\cdot6\cdot4=\boxed{360}$.

Answer 7CU.

The objective is to evaluate the expression $\frac{5}{6}\cdot 16\cdot 9\frac{3}{4}$.

To evaluate the expression, write the mix fraction as a single fraction.

$\frac{5}{6}\cdot 16\cdot 9\frac{3}{4}$

$=\frac{5}{6}\cdot 16\cdot\frac{39}{4}$

$=\frac{5}{6}\cdot\frac{39}{4}\cdot 16$ [Use Commutative property: $ab=ba$]

$=\left(\frac{5}{6}\cdot\frac{39}{4}\right)\cdot 16$ [Use Associative property; $(ab)c=a(bc)$]

$=\left(\frac{5}{2}\cdot\frac{13}{4}\right)\cdot 16$ [Simplify inside parentheses]

$=\left(\frac{65}{8}\right)\cdot 16$ [Multiply inside parentheses]

$=65\cdot 2$ [Divide]

$=130$ [Multiply]

Therefore, $\frac{5}{6}\cdot 16\cdot 9\frac{3}{4}=\boxed{130}$.

Answer 8CU.

Consider the expression $4x+5y+6x$.

The objective is to simplify the expression.

To simplify the expression, first use commutative property of addition: $a+b=b+a$.

$4x+5y+6x$

$=4x+6x+5y$ [Use commutative property of addition]

$=(4+6)x+5y$ $\left[\text{Use Distributive property}: (b+c)a=ba+ca\right]$

$=10x+5y$ [Use Substitution property; if $a=b$, then a may be substituted for *b*]

Therefore, $4x+5y+6x=\boxed{10x+5y}$.

Answer 9CU.

Consider the expression $5a+3b+2a+7b$.

The objective is to simplify the expression.

To simplify the expression, first use commutative property of addition: $a+b=b+a$.

$5a+3b+2a+7b$

$=5a+2a+3b+7b$ [Use commutative property of addition]

$=(5a+2a)+(3b+7b)$ $\left[\text{Use Associative property: } a+(b+c)=(a+b)+c\right]$

$=(5+2)a+(3+7)b$ $\left[\text{Use Distributive property: } (b+c)a=ba+ca\right]$

$=7a+10b$ [Use Substitution property; if $a=b$, then *a* may be substituted for *b*]

Therefore, $5a+3b+2a+7b=\boxed{7a+10b}$.

Answer 10CU.

Consider the expression $\frac{1}{4}q+2q+2\frac{3}{4}q$.

The objective is to simplify the expression.

To simplify the expression, first rewrite the mixed fraction as a singe fraction.

$\frac{1}{4}q+2q+2\frac{3}{4}q$

$=\frac{1}{4}q+2q+\frac{11}{4}q$

$=\frac{1}{4}q+\frac{11}{4}q+2q$ [Use commutative property of addition; $a+b=b+a$]

$=\left(\frac{1}{4}q+\frac{11}{4}q\right)+2q$ $\left[\text{Use Associative property: } a+(b+c)=(a+b)+c\right]$

$=\left(\frac{1}{4}+\frac{11}{4}\right)q+2q$ $\left[\text{Use Distributive property: } (b+c)a=ba+ca\right]$

$=\left(\frac{1+11}{4}\right)q+2q$ [Simplify inside parentheses]

$=\left(\frac{12}{4}\right)q+2q$ [Simplify]

$=3q+2q$ [Use Substitution property; if $a=b$, then *a* may be substituted for *b*]

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

$=5q$ [Use Substitution property]

Therefore, $\frac{1}{4}q+2q+2\frac{3}{4}q=\boxed{5q}$.

Answer 11CU.

Consider the expression $3(4x+2)+2x$.

The objective is to simplify the expression.

To simplify the expression, first use Distributive property.

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

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

$=12x+6+2x$ [Simplify]

$=12x+2x+6$ [Use commutative property of addition; $a+b=b+a$]

$=(12x+2x)+6$ $\left[\text{Use Associative property: a}+(b+c)=(a+b)+c\right]$

$=(12+2)x+6$ $\left[\text{Use Distributive property: }(b+c)a=ba+ca\right]$

$=14x+6$ [Use Substitution property; if $a=b$, then *a* may be substituted for *b*]

Therefore, $3(4x+2)+2x=\boxed{14x+6}$.

Answer 12CU.

Consider the expression $7(ac+2b)+2ac$.

The objective is to simplify the expression.

To simplify the expression, first use Distributive property.

$7(ac+2b)+2ac$

$=7\cdot ac+7\cdot 2b+2ac$ $\left[\text{Use Distributive property: a}(b+c)=ab+ac\right]$

$=7ac+14b+2ac$ [Multiply]

$=7ac+2ac+14b$ [Use commutative property of addition; $a+b=b+a$]

$=(7ac+2ac)+14b$ $\left[\text{Use Associative property: a}+(b+c)=(a+b)+c\right]$

$=(7+2)ac+14b$ $\left[\text{Use Distributive property: }(b+c)a=ba+ca\right]$

$=9ac+14b$ [Use Substitution property; if $a=b$, then *a* may be substituted for *b*]

Therefore, $7(ac+2b)+2ac=\boxed{9ac+14b}$.

Answer 13CU.

Consider the expression $3(x+2y)+4(3x+y)$.

The objective is to simplify the expression.

To simplify the expression, first use Distributive property.

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

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

$=3x+6y+12x+4y$ [Multiply]

$=3x+12x+6y+4y$ [Use commutative property of addition; $a+b=b+a$]

$=(3x+12x)+(6y+4y)$ $\left[\text{Use Associative property: a}+(b+c)=(a+b)+c\right]$

$=(3+12)x+(6+4)y$ $\left[\text{Use Distributive property: }(b+c)a=ba+ca\right]$

$=15x+10y$ [Use Substitution property; if $a=b$, then a may be substituted for *b*]

Therefore, $3(x+2y)+4(3x+y)=\boxed{15x+10y}$.

Answer 14CU.

To simplify the expression, use the Distributive property of addition first.

$\frac{1}{2}(p+2q)+\frac{3}{4}q$

$=\frac{1}{2}p+\frac{1}{2}\cdot 2q+\frac{3}{4}q$ $\left[\text{Use Distributive property: }a(b+c)=ab+ac\right]$

$=\frac{1}{2}p+q+\frac{3}{4}q$

$=\frac{1}{2}p+\left(1+\frac{3}{4}\right)q$ [Use Associative property]

$=\frac{1}{2}p+\left(\frac{4+3}{4}\right)q$

$=\frac{1}{2}p+\frac{7}{4}q$ [Use Substitution property]

Therefore, $\frac{1}{2}(p+2q)+\frac{3}{4}q=\boxed{\frac{1}{2}p+\frac{7}{4}q}$.

Answer 15CU.

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

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

To find the area of a smaller triangle, substitute $\text{Base} = 5.2,\ \text{Altitude} = 4.5$ in (1).

$$\begin{aligned}\text{Area} &= \frac{1}{2}(5.2)(4.5)\\ &= 11.7\end{aligned}$$

Thus, the area of a smaller triangle is $11.7\ \text{cm}^2$.

The area of the large triangle is the sum of the areas of the four smaller triangles.

$$\begin{aligned}\text{Area of the large triangle} &= 4(\text{Area of a smaller triangle})\\ &= 4(11.7)\ \text{cm}^2\\ &= 46.8\ \text{cm}^2\end{aligned}$$

Therefore, the area of the large triangle is $\boxed{46.8\ \text{cm}^2}$.

Answer 16PA.

The objective is to evaluate the expression $17+6+13+24$.

To evaluate the expression, first use the commutative property of addition: $a+b=b+a$.

$17+6+13+24$

$=17+13+24+6$ [Use the commutative property]

$=(17+13)+(24+6)$ $[\text{Use Associative property: } a+(b+c)=(a+b)+c]$

$=30+30$ [Add inside parentheses]

$=60$ [Add]

Therefore, $17+6+13+24=\boxed{60}$.

Answer 17PA.

The objective is to evaluate the expression $8+14+22+29$.

To evaluate the expression, first use the Associative property of addition to make two groups.

$8+14+22+29$

$=(8+14)+(22+29)$ $[\text{Use Associative property: } a+(b+c)=(a+b)+c]$

$=22+51$ [Add inside parentheses]

$=73$ [Add]

Therefore, $8+14+22+29=\boxed{73}$.

Answer 18PA.

The objective is to evaluate the expression $4.25+3.50+8.25$.

To evaluate the expression, first use the commutative property of addition: $a+b=b+a$.

$4.25+3.50+8.25$

$=4.25+8.25+3.50$ [Use the commutative property]

$=(4.25+8.25)+3.50$ $\left[\text{Use Associative property}: a+(b+c)=(a+b)+c\right]$

$=12.50+3.50$ [Add inside parentheses]

$=16$ [Add]

Therefore, $4.25+3.50+8.25=\boxed{16}$.

Answer 19PA.

The objective is to evaluate the expression $6.2+4.2+4.3+5.8$.

To evaluate the expression, first use the commutative property of addition: $a+b=b+a$ to make groups for addition.

$6.2+4.2+4.3+5.8$

$=6.2+4.3+5.8+4.2$ [Use the commutative property]

$=(6.2+4.3)+(5.8+4.2)$ $\left[\text{Use Associative property}: a+(b+c)=(a+b)+c\right]$

$=10.5+10$ [Add inside parentheses]

$=20.5$ [Add]

Therefore, $6.2+4.2+4.3+5.8=\boxed{20.5}$.

Answer 20PA.

The objective is to evaluate the expression $6\frac{1}{2}+3+\frac{1}{2}+2$.

To evaluate the expression, first break the mixed fraction.

$6\frac{1}{2}+3+\frac{1}{2}+2$

$=6+\frac{1}{2}+3+\frac{1}{2}+2$ $\left[6\frac{1}{2}=6+\frac{1}{2}\right]$

$=6+3+2+\frac{1}{2}+\frac{1}{2}$ [Use the commutative property of addition: $a+b=b+a$]

$=(6+3)+2+\left(\frac{1}{2}+\frac{1}{2}\right)$ $\left[\text{Use Associative property}: a+(b+c)=(a+b)+c\right]$

$=9+2+1$ [Add inside parentheses]

$=(9+2)+1$ $\left[\text{Use Associative property}: a+(b+c)=(a+b)+c\right]$

$=11+1$ [Add inside parentheses]

$=12$ [Add]

Therefore, $6\frac{1}{2}+3+\frac{1}{2}+2=\boxed{12}$.

Answer 21PA.

The objective is to evaluate the expression $2\frac{3}{8}+4+3\frac{3}{8}$.

To evaluate the expression, first break the mixed fractions.

$$2\frac{3}{8}+4+3\frac{3}{8}$$

$$=2+\frac{3}{8}+4+3+\frac{3}{8} \quad \left[2\frac{3}{8}=2+\frac{3}{8};3\frac{3}{8}=3+\frac{3}{8}\right]$$

$=2+4+3+\frac{3}{8}+\frac{3}{8}$ [Use the commutative property of addition: $a+b=b+a$]

$$=(2+4)+3+\left(\frac{3}{8}+\frac{3}{8}\right) \quad \left[\text{Use Associative property: } a+(b+c)=(a+b)+c\right]$$

$=6+3+\left(\frac{3+3}{8}\right)$ [Add inside parentheses]

$$=(6+3)+\left(\frac{6}{8}\right) \quad \left[\text{Use Associative property: } a+(b+c)=(a+b)+c\right]$$

$=9+\frac{3}{4}$ [Add inside parentheses]

$$=9\frac{3}{4} \quad \left[9+\frac{3}{4}=9\frac{3}{4}\right]$$

Therefore, $2\frac{3}{8}+4+3\frac{3}{8}=\boxed{9\frac{3}{4}}$.

Answer 22PA.

The objective is to evaluate the expression $5\cdot 11\cdot 4\cdot 2$.

To evaluate the expression, rearrange and group the numbers to make the mental calculations easier.

$$5\cdot 11\cdot 4\cdot 2$$

$=11\cdot 4\cdot 5\cdot 2$ [Use the commutative property of multiplication: $ab=ba$]

$$=(11\cdot 4)\cdot(5\cdot 2) \quad \left[\text{Use Associative property: } a(bc)=(ab)c\right]$$

$=44\cdot 10$ [Multiply inside parentheses]

$=440$ [Multiply]

Therefore, $5\cdot 11\cdot 4\cdot 2=\boxed{440}$.

Answer 23PA.

The objective is to evaluate the expression $3 \cdot 10 \cdot 6 \cdot 3$.

To evaluate the expression, rearrange and group the numbers to make the mental calculations easier.

$3 \cdot 10 \cdot 6 \cdot 3$

$= 3 \cdot 3 \cdot 10 \cdot 6$ [Use the commutative property of multiplication: $ab = ba$]

$= (3 \cdot 3) \cdot (10 \cdot 6)$ $\left[\text{Use Associative property: } a(bc) = (ab)c\right]$

$= 9 \cdot 60$ [Multiply inside parentheses]

$= 540$ [Multiply]

Therefore, $3 \cdot 10 \cdot 6 \cdot 3 = \boxed{540}$.

Answer 24PA.

The objective is to evaluate the expression $0.5 \cdot 2.4 \cdot 4$.

To evaluate the expression, rearrange and group the numbers to make the mental calculations easier.

$0.5 \cdot 2.4 \cdot 4$

$= 0.5 \cdot 4 \cdot 2.4$ [Use the commutative property of multiplication: $ab = ba$]

$= (0.5 \cdot 4) \cdot 2.4$ $\left[\text{Use Associative property: } a(bc) = (ab)c\right]$

$= 2 \cdot 2.4$ [Multiply inside parentheses]

$= 4.8$ [Multiply]

Therefore, $0.5 \cdot 2.4 \cdot 4 = \boxed{4.8}$.

Answer 25PA.

The objective is to evaluate the expression $8 \cdot 1.6 \cdot 2.5$.

To evaluate the expression, rearrange and group the numbers to make the mental calculations easier.

$8 \cdot 1.6 \cdot 2.5$

$= 1.6 \cdot 2.5 \cdot 8$ [Use the commutative property of multiplication: $ab = ba$]

$= 1.6 \cdot (2.5 \cdot 8)$ $\left[\text{Use Associative property: } a(bc) = (ab)c\right]$

$= 1.6 \cdot (20)$ [Multiply inside parentheses]

$= 32$ [Multiply]

Therefore, $8 \cdot 1.6 \cdot 2.5 = \boxed{32}$.

Answer 26PA.

The objective is to evaluate the expression $3\frac{3}{7}\cdot 14\cdot 1\frac{1}{4}$.

To evaluate the expression, first rewrite the mixed fractions as a single fraction.

$$3\frac{3}{7}\cdot 14\cdot 1\frac{1}{4}$$

$$=\frac{24}{7}\cdot 14\cdot\frac{5}{4}\quad\left[3\frac{3}{7}=\frac{24}{7}\right]$$

$=\frac{24}{7}\cdot\frac{5}{4}\cdot 14$ [Use the commutative property of multiplication: $ab=ba$]

$$=\left(\frac{24}{7}\cdot\frac{5}{4}\right)\cdot 14\quad\left[\text{Use Associative property: a}(bc)=(ab)c\right]$$

$=\left(\frac{6\cdot 5}{7}\right)\cdot 14$ [Multiply inside parentheses]

$=\frac{30}{7}\cdot 14$ [Simplify]

$=30\cdot 2$ [Divide]

$=60$ [Multiply]

Therefore, $3\frac{3}{7}\cdot 14\cdot 1\frac{1}{4}=\boxed{60}$.

Answer 27PA.

The objective is to evaluate the expression $2\frac{5}{8}\cdot 24\cdot 6\frac{2}{3}$.

To evaluate the expression, first rewrite the mixed fractions as a single fraction.

$$2\frac{5}{8}\cdot 24\cdot 6\frac{2}{3}$$

$$=\frac{21}{8}\cdot 24\cdot\frac{20}{3}\quad\left[2\frac{5}{8}=\frac{21}{8}\right]$$

$$=\left(\frac{21}{8}\cdot 24\right)\cdot\frac{20}{3}\quad\left[\text{Use Associative property: a}(bc)=(ab)c\right]$$

$=(21\cdot 3)\cdot\frac{20}{3}$ [Divide inside parentheses]

$$=21\cdot\left(3\cdot\frac{20}{3}\right)\quad\left[\text{Use Associative property: a}(bc)=(ab)c\right]$$

$=21\cdot 20$ [Divide inside parentheses]

$=420$ [Multiply]

Therefore, $2\frac{5}{8}\cdot 24\cdot 6\frac{2}{3}=\boxed{420}$.

Answer 28PA.

The number of weeknights in his stay is 2.

The number of weekends in his stay is 2.

The total cost of the room for 4 days is

$$\begin{aligned}\text{Cost} &= \$\left[2(72)+2(63)\right]\\ &= \$(144+126)\\ &= \$266\end{aligned}$$

Therefore, the cost of the room is $\boxed{\$266}$.

Answer 29PA.

The number of weeknights in his stay is 2.

The number of weekends in his stay is 2.

The total cost of the room for 4 days is

$$\begin{aligned}\text{Cost} &= \$\left[2(72+5.40)+2(63+5.10)\right]\\ &= \$\left[2(77.40)+2(68.10)\right]\\ &= \$(154.8+136.2)\\ &= \$291\end{aligned}$$

Therefore, the cost of the room is $\boxed{\$291}$.

Answer 30PA.

The expression for total sales of the clerk after renting 2 DVDs, 3 new releases and 2 older videos is

$$\begin{aligned}\text{total sales} &= 2(3.99)+3(4.99)+2(2.99)\\ &= 7.98+14.97+5.98\\ &= 27.43\end{aligned}$$

The expression for total sales of the clerk after selling 5 used videos is

$$\text{total sales} = 5(9.99)$$

Therefore, the two expressions for total sales of the clerk is

$\boxed{2(3.99)+3(4.99)+2(2.99) \text{ and } 5(9.99)}$.

Answer 31PA.

Consider that the rent of new release videos is \$4.49.

The rent of older videos is \$2.99.

The rent of DVDs is \$3.99.

The price of used videos is \$9.99.

The objective is to find the total sales of the clerk after renting 2 DVDs, 3 new releases, 2 older videos and selling 5 used videos.

The expression for total sales of the clerk after renting 2 DVDs, 3 new releases, 2 older videos and selling 5 used videos is

$$\begin{aligned}\text{Total sales} &= 2(3.99)+3(4.49)+2(2.99)+5(9.99)\\ &= 7.98+14.97+5.98+49.95\\ &= 77.38\end{aligned}$$

Therefore, the total sales of the clerk is $\boxed{\$77.38}$.

Answer 32PA.

Consider the expression $4a+2b+a$.

The objective is to simplify the expression.

To simplify the expression, first use commutative property of addition: $a+b=b+a$.

$4a+2b+a$

$=4a+a+2b$ [Use commutative property of addition]

$=(4a+a)+2b \quad \left[\text{Use Associative property: } a+(b+c)=(a+b)+c\right]$

$=(4+1)a+2b \quad \left[\text{Use Distributive property: } (b+c)a=ba+ca\right]$

$=5a+2b$ [Use Substitution property; if $a=b$, then *a* may be substituted for *b*]

Therefore, $4a+2b+a=\boxed{5a+2b}$.

Answer 33PA.

Consider the expression $2y+2x+8y$.

The objective is to simplify the expression.

To simplify the expression, first use commutative property of addition: $a+b=b+a$.

$2y+2x+8y$

$=2x+2y+8y$ [Use commutative property of addition]

$=2x+(2y+8y)$ $[\text{Use Associative property}: a+(b+c)=(a+b)+c]$

$=2x+(2+8)y$ $[\text{Use Distributive property}: (b+c)a=ba+ca]$

$=2x+10y$ [Use Substitution property; if $a=b$, then *a* may be substituted for *b*]

Therefore, $2y+2x+8y=\boxed{2x+10y}$.

Answer 34PA.

Consider the expression $x^2+3x+2x+5x^2$.

The objective is to simplify the expression.

To simplify the expression, first use commutative property of addition: $a+b=b+a$.

$x^2+3x+2x+5x^2$

$=x^2+5x^2+3x+2x$ [Use commutative property of addition]

$=(x^2+5x^2)+(3x+2x)$ $[\text{Use Associative property}: a+(b+c)=(a+b)+c]$

$=(1+5)x^2+(3+2)x$ $[\text{Use Distributive property}: (b+c)a=ba+ca]$

$=6x^2+5x$ [Use Substitution property; if $a=b$, then *a* may be substituted for *b*]

Therefore, $x^2+3x+2x+5x^2=\boxed{6x^2+5x}$.

Answer 35PA.

Consider the expression $4a^3+6a+3a^3+8a$.

The objective is to simplify the expression.

To simplify the expression, first use commutative property of addition: $a+b=b+a$.

$4a^3+6a+3a^3+8a$

$=4a^3+3a^3+6a+8a$ [Use commutative property of addition]

$=(4a^3+3a^3)+(6a+8a)$ $[\text{Use Associative property}: a+(b+c)=(a+b)+c]$

$=(4+3)a^3+(6+8)a$ $[\text{Use Distributive property}: (b+c)a=ba+ca]$

$=7a^3+14a$ [Use Substitution property; if $a=b$, then *a* may be substituted for *b*]

Therefore, $4a^3+6a+3a^3+8a=\boxed{7a^3+14a}$.

Answer 36PA.

Consider the expression $6x+2(2x+7)$.

The objective is to simplify the expression.

To simplify the expression, first use Distributive property.

$6x+2(2x+7)$

$=6x+2\cdot 2x+2\cdot 7$ $[\text{Use Distributive property}: \text{a}(b+c)=ab+ac]$

$=6x+4x+14$ [Multiply]

$=(6x+4x)+14$ $[\text{Use Associative property}: \text{a}+(b+c)=(a+b)+c]$

$=(6+4)x+14$ $[\text{Use Distributive property}: (b+c)a=ba+ca]$

$=10x+14$ [Use Substitution property; if $a=b$, then *a* may be substituted for *b*]

Therefore, $6x+2(2x+7)=\boxed{10x+14}$.

Answer 37PA.

Consider the expression $5n+4(3n+9)$.

The objective is to simplify the expression.

To simplify the expression, first use Distributive property.

$5n+4(3n+9)$

$=5n+4\cdot 3n+4\cdot 9$ $\left[\text{Use Distributive property: } a(b+c)=ab+ac\right]$

$=5n+12n+36$ [Multiply]

$=(5n+12n)+36$ $\left[\text{Use Associative property: } a+(b+c)=(a+b)+c\right]$

$=(5+12)n+36$ $\left[\text{Use Distributive property: } (b+c)a=ba+ca\right]$

$=17n+36$ [Use Substitution property; if $a=b$, then *a* may be substituted for *b*]

Therefore, $5n+4(3n+9)=\boxed{17n+36}$.

Answer 38PA.

Consider the expression $3(x+2y)+4(3x+y)$.

The objective is to simplify the expression.

To simplify the expression, first use Distributive property.

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

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

$=3x+6y+12x+4y$ [Multiply]

$=3x+12x+6y+4y$ [Use commutative property of addition]

$=(3x+12x)+(6y+4y)$ $\left[\text{Use Associative property: } a+(b+c)=(a+b)+c\right]$

$=(3+12)x+(6+4)y$ $\left[\text{Use Distributive property: } (b+c)a=ba+ca\right]$

$=15x+10y$ [Use Substitution property; if $a=b$, then *a* may be substituted for *b*]

Therefore, $3(x+2y)+4(3x+y)=\boxed{15x+10y}$.

Answer 39PA.

Consider the expression $3.2(x+y)+2.3(x+y)+4x$.

The objective is to simplify the expression.

To simplify the expression, first use Distributive property.

$3.2(x+y)+2.3(x+y)+4x$

$=3.2x+3.2y+2.3x+2.3y+4x$ $\left[\text{Use Distributive property: a}(b+c)=ab+ac\right]$

$=3.2x+2.3x+4x+3.2y+2.3y$ [Use commutative property of addition]

$=(3.2+2.3)x+4x+(3.2+2.3)y$

$\left[\text{Use Associative property: a}+(b+c)=(a+b)+c\right]$

$=5.5x+4x+5.5y$ [Use Substitution property; if $a=b$, then *a* may be substituted for *b*]

$=(5.5x+4x)+5.5y$ $\left[\text{Use Associative property: a}+(b+c)=(a+b)+c\right]$

$=(5.5+4)x+5.5y$ $\left[\text{Use Distributive property: }(b+c)a=ba+ca\right]$

$=9.5x+5.5y$ [Use Substitution property]

Therefore, $3.2(x+y)+2.3(x+y)+4x=\boxed{9.5x+5.5y}$.

Answer 40PA.

Consider the expression $3(4m+n)+2m$.

The objective is to simplify the expression.

To simplify the expression, first use Distributive property.

$3(4m+n)+2m$

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

$=12m+3n+2m$ [Multiply]

$=12m+2m+3n$ [Use commutative property of addition]

$=(12m+2m)+3n$ $\left[\text{Use Associative property: a}+(b+c)=(a+b)+c\right]$

$=(12+2)m+3n$ $\left[\text{Use Distributive property: }(b+c)a=ba+ca\right]$

$=14m+3n$ [Use Substitution property; if $a=b$, then *a* may be substituted for *b*]

Therefore, $3(4m+n)+2m=\boxed{14m+3n}$.

Answer 41PA.

Consider the expression $6(0.4f+0.2g)+0.5f$.

The objective is to simplify the expression.

To simplify the expression, first use Distributive property.

$6(0.4f+0.2g)+0.5f$

$=6\cdot(0.4f)+6\cdot(0.2g)+0.5f$ $[\text{Use Distributive property}: \text{a}(b+c)=ab+ac]$

$=2.4f+1.2g+0.5f$ [Multiply]

$=2.4f+0.5f+1.2g$ [Use commutative property of addition]

$=(2.4f+0.5f)+1.2g$ $[\text{Use Associative property}: \text{a}+(b+c)=(a+b)+c]$

$=(2.4+0.5)f+1.2g$ $[\text{Use Distributive property}: (b+c)a=ba+ca]$

$=2.9f+1.2g$ [Use Substitution property; if $a=b$, then *a* may be substituted for *b*]

Therefore, $6(0.4f+0.2g)+0.5f=\boxed{2.9f+1.2g}$.

Answer 42PA.

Consider the expression $\frac{3}{4}+\frac{2}{3}(s+2t)+s$.

The objective is to simplify the expression.

To simplify the expression, first use Distributive property.

$\frac{3}{4}+\frac{2}{3}(s+2t)+s$

$=\frac{3}{4}+\frac{2}{3}s+\frac{2}{3}\cdot 2t+s$ $[\text{Use Distributive property}: \text{a}(b+c)=ab+ac]$

$=\frac{2}{3}s+s+\frac{4}{3}t+\frac{3}{4}$ [Use commutative property of addition]

$=\left(\frac{2}{3}s+s\right)+\frac{4}{3}t+\frac{3}{4}$ $[\text{Use Associative property}: \text{a}+(b+c)=(a+b)+c]$

$=\left(\frac{2}{3}+1\right)s+\frac{4}{3}t+\frac{3}{4}$ $[\text{Use Distributive property}: (b+c)a=ba+ca]$

$=\left(\frac{2+3}{3}\right)s+\frac{4}{3}t+\frac{3}{4}$ [Simplify]

$=\frac{5}{3}s+\frac{4}{3}t+\frac{3}{4}$ [Use Substitution property; if $a=b$, then *a* may be substituted for *b*]

Therefore, $\frac{3}{4}+\frac{2}{3}(s+2t)+s=\boxed{\frac{5}{3}s+\frac{4}{3}t+\frac{3}{4}}$.

Answer 43PA.

Consider the expression $2p+\frac{3}{5}\left(\frac{1}{2}p+2q\right)+\frac{2}{3}$.

The objective is to simplify the expression.

To simplify the expression, first use Distributive property.

$$2p+\frac{3}{5}\left(\frac{1}{2}p+2q\right)+\frac{2}{3}$$

$$=2p+\frac{3}{5}\cdot\frac{1}{2}p+\frac{3}{5}\cdot 2q+\frac{2}{3} \quad \left[\text{Use Distributive property: } a(b+c)=ab+ac\right]$$

$$=2p+\frac{3}{10}p+\frac{6}{5}q+\frac{2}{3} \quad \text{[Multiply]}$$

$$=\left(2p+\frac{3}{10}p\right)+\frac{6}{5}q+\frac{2}{3} \quad \left[\text{Use Associative property: } a+(b+c)=(a+b)+c\right]$$

$$=\left(2+\frac{3}{10}\right)p+\frac{6}{5}q+\frac{2}{3} \quad \left[\text{Use Distributive property: } (b+c)a=ba+ca\right]$$

$$=\left(\frac{20+3}{10}\right)p+\frac{6}{5}q+\frac{2}{3} \quad \text{[Simplify]}$$

$$=\frac{23}{10}p+\frac{6}{5}q+\frac{2}{3} \quad \text{[Simplify]}$$

$$=\frac{2}{3}+\frac{23}{10}p+\frac{6}{5}q \quad \text{[Use commutative property of addition]}$$

Therefore, $2p+\frac{3}{5}\left(\frac{1}{2}p+2q\right)+\frac{2}{3}=\boxed{\frac{2}{3}+\frac{23}{10}p+\frac{6}{5}q}$.

Answer 44PA.

The objective is to write an algebraic expression for the verbal expression: "twice the sum of s and t decreased by s."

An algebraic expression contains letters and variables with an arithmetic operation.

The word "sum" corresponds to addition and the phrase "decreased by" corresponds to subtraction.

The algebraic expression for the verbal expression: "twice the sum of s and t" is

$$2(s+t).$$

To find the algebraic expression for the complete verbal expression, subtract s from

$$2(s+t).$$

Thus, the algebraic expression for the complete verbal expression is $\boxed{2(s+t)-s}$.

To simplify the expression, use the Distributive property of addition first.

$$2(s+t)-s$$

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

$$=2s-s+2t \quad \text{[Use commutative property of addition]}$$

$$=(2s-s)+2t \quad \left[\text{Use Associative property: } a+(b+c)=(a+b)+c\right]$$

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

$$=s+2t \quad \text{[Use Substitution property]}$$

Therefore, $2(s+t)-s=\boxed{s+2t}$.

Answer 45PA.

The objective is to write an algebraic expression for the verbal expression: "five times the product of *x* and *y* increased by $3xy$."

An algebraic expression contains letters and variables with an arithmetic operation.

The word "product" corresponds to multiplication and the phrase "increased by" corresponds to addition.

The algebraic expression for the verbal expression: "five times the product of *x* and *y*" is

$5xy$.

To find the algebraic expression for the complete verbal expression, add $3xy$ to $5xy$.

Thus, the algebraic expression for the complete verbal expression is $\boxed{5xy+3xy}$.

To simplify the expression, use the Distributive property of addition first.

$$5xy+3xy$$

$$=(5+3)xy \quad [\text{Use Distributive property}:(b+c)a=ba+ca]$$

$=8xy$ [Use Substitution property]

Therefore, $5xy+3xy=\boxed{8xy}$.

Answer 46PA.

The objective is to write an algebraic expression for the verbal expression: "the product of six and the square of *z*, increased by the sum of seven, z^2, and 6."

An algebraic expression contains letters and variables with an arithmetic operation.

The word "product" corresponds to multiplication and the phrase "increased by" corresponds to addition.

The algebraic expression for the verbal expression: "the product of six and the square of *z*" is $6z^2$.

The algebraic expression for the verbal expression: "the sum of seven, z^2, and 6" is $7+z^2+6$.

To find the algebraic expression for the complete verbal expression, add $7+z^2+6$ to $6z^2$.

Thus, the algebraic expression for the complete verbal expression is $\boxed{6z^2+(7+z^2+6)}$.

To simplify the expression, use the Distributive property of addition first.

$$6z^2+(7+z^2+6)$$

$$=6z^2+7+z^2+6 \quad [\text{Use Distributive property}:a(b+c)=ab+ac]$$

$=6z^2+z^2+7+6$ [Use commutative property of addition]

$$=(6z^2+z^2)+(7+6) \quad [\text{Use Associative property}: a+(b+c)=(a+b)+c]$$

$$=(6+1)z^2+(7+6) \quad [\text{Use Distributive property}:(b+c)a=ba+ca]$$

$=7z^2+13$ [Use Substitution property]

Therefore, $6z^2+(7+z^2+6)=\boxed{7z^2+13}$.

Answer 47PA.

The objective is to write an algebraic expression for the verbal expression: "six times the sum of *x* and *y* squared decreased by three times the sum of *x* and half of y squared."

An algebraic expression contains letters and variables with an arithmetic operation.

The word "product" corresponds to multiplication and the phrase "increased by" corresponds to addition.

The algebraic expression for the verbal expression: "six times the sum of *x* and *y* squared" is $6\left(x+y^2\right)$.

The algebraic expression for the verbal expression: "three times the sum of *x* and half of y squared" is $3\left(x+\frac{1}{2}y^2\right)$.

To find the algebraic expression for the complete verbal expression, subtract $3\left(x+\frac{1}{2}y^2\right)$ from $6\left(x+y^2\right)$.

Thus, the algebraic expression for the complete verbal expression is $\boxed{6\left(x+y^2\right)-3\left(x+\frac{1}{2}y^2\right)}$

.

To simplify the expression, use the Distributive property of addition first.

$$6\left(x+y^2\right)-3\left(x+\frac{1}{2}y^2\right)$$

$$=6x+6y^2-3x-3\cdot\frac{1}{2}y^2 \quad \left[\text{Use Distributive property}: a(b+c)=ab+ac\right]$$

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

$$=6x-3x+6y^2-\frac{3}{2}y^2 \text{ [Use commutative property of addition]}$$

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

$$=x(3)+y^2\left(\frac{12-3}{2}\right)$$

$$=3x+\frac{9}{2}y^2 \text{ [Use Substitution property]}$$

$$=3x+4\frac{1}{2}y^2$$

Therefore, $6\left(x+y^2\right)-3\left(x+\frac{1}{2}y^2\right)=\boxed{3x+4\frac{1}{2}y^2}$.

Answer 48PA.

The commutative property of addition says that the order in which you add numbers does not change their sum.

The commutative property of addition is

$$a+b=b+a$$

For two numbers 2 and 3,

$$2-3\neq 3-2$$

The commutative property does not hold here.

For two numbers 1 and 1,

$$1-1=1-1$$

The commutative property holds here.

For two numbers 0 and 0,

$$0-0=0-0$$

The commutative property holds here.

Thus, the commutative property $\boxed{\text{sometimes}}$ holds for subtraction.

Answer 49PA.

The commutative property of addition is

$$a+b=b+a$$

The associative property of addition is

$$\mathrm{a}+(b+c)=(a+b)+c$$

To determine the distance from the airport to Five points, find the following sum:

$$\begin{aligned} d &= 0+0.4+1.5+1.5+1.1+1.9+1.8+0.8 \\ &= 0.4+1.1+1.5+1.5+1.9+1.8+0.8 \\ &= (0.4+1.1)+(1.5+1.5)+(1.9+1.8+0.8) \\ &= (1.5+3)+5.5 \end{aligned}$$

$$=4.5+5.5$$

$$=10$$

Therefore, the distance from the airport to Five points is $\boxed{10}$.

You can use the commutative and associative properties to rearrange and group numbers for easier calculations.

Answer 50PA.

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Consider the expression $6(ac+2b)+2ac$.

The objective is to simplify the expression.

To simplify the expression, first use Distributive property.

$$6(ac+2b)+2ac$$

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

$= 6ac+12b+2ac$ [Simplify]

$= 6ac+2ac+12b$ [Use commutative property of addition; $a+b=b+a$]

$= (6ac+2ac)+12b$ $\left[\text{Use Associative property: } a+(b+c)=(a+b)+c\right]$

$= (6+2)ac+12b$ $\left[\text{Use Distributive property: } (b+c)a=ba+ca\right]$

$= 8ac+12b$ [Use Substitution property; if $a=b$, then *a* may be substituted for *b*]

Thus, .

Therefore, the correct option for simplified expression of $6(ac+2b)+2ac$ is $\boxed{(\text{C})}$.

Answer 51PA.

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

$\text{Area} = lw$ ...... (1)

The area of the first rectangle is $(5\cdot 6)\ \text{cm}^2$.

The area of the second rectangle is $(6\cdot 5)\ \text{cm}^2$.

The commutative property of multiplication is

$$a\cdot b=b\cdot a$$

Using commutative property,

$$\begin{aligned}5\cdot 6&=6\cdot 5\\&=30\end{aligned}$$

Thus, the areas of the two rectangles are equal.

Therefore, the correct option for the property that can be used to show that the areas of the two rectangles are equal is $\boxed{(\text{B})}$.

Answer 52MYS.

Consider the expression $5(2+x)+7x$.

The objective is to simplify the expression.

To simplify the expression, first use Distributive property.

$5(2+x)+7x$

$=5\cdot 2+5\cdot x+7x$ $\left[\text{Use Distributive property: } a(b+c)=ab+ac\right]$

$=10+5x+7x$ [Multiply]

$=10+(5+7)x$ $\left[\text{Use Distributive property}:(b+c)a=ba+ca\right]$

$=10+12x$ [Perform addition]

Therefore, $5(2+x)+7x=\boxed{10+12x}$.

Answer 54MYS.

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

The objective is to simplify the expression.

To simplify the expression, first use Distributive property.

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

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

$=3a+6b-3a$ [Perform multiplication]

$=3a-3a+6b$ [Use commutative property of addition; $a+b=b+a$]

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

$=(0)a+6b$ [Use Substitution property; if $a=b$, then *a* may be substituted for *b*]

$=6b$

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

Answer 55MYS.

Consider the expression $7m+6(n+m)$.

The objective is to simplify the expression.

To simplify the expression, first use Distributive property.

$7m+6(n+m)$

$=7m+6n+6m$ $\left[\text{Use Distributive property: } a(b+c)=ab+ac\right]$

$=7m+6m+6n$ [Use commutative property of addition; $a+b=b+a$]

$=(7m+6m)+6n$ $\left[\text{Use Associative property: } a+(b+c)=(a+b)+c\right]$

$=(7+6)m+6n$ $\left[\text{Use Distributive property}: (b+c)a=ba+ca\right]$

$=13m+6n$ [Use Substitution property; if $a=b$, then *a* may be substituted for *b*]

Therefore, $7m+6(n+m)=\boxed{13m+6n}$.

Answer 56MYS.

Consider the expression $(d+5)f+2f$.

The objective is to simplify the expression.

To simplify the expression, first use Distributive property.

$(d+5)f+2f$

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

$=df+(5f+2f)$ $\left[\text{Use Associative property: } a+(b+c)=(a+b)+c\right]$

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

$=df+7f$ [Use Substitution property; if $a=b$, then *a* may be substituted for *b*]

$=(d+7)f$ $\left[\text{Use Distributive property}: (b+c)a=ba+ca\right]$

Therefore, $(d+5)f+2f=\boxed{(d+7)f}$.

Answer 57MYS.

Consider the expression t^2+2t^2+4t.

The objective is to simplify the expression.

To simplify the expression, first use Associative property.

t^2+2t^2+4t

$=(t^2+2t^2)+4t$ [Use Associative property: $a+(b+c)=(a+b)+c$]

$=(1+2)t^2+4t$ [Use Distributive property: $(b+c)a=ba+ca$]

$=3t^2+4t$ [Use Substitution property; if $a=b$, then *a* may be substituted for *b*]

Therefore, $t^2+2t^2+4t=\boxed{3t^2+4t}$.

Answer 58MYS.

The properties used in each step of the solution are shown below:

$3(10-5\cdot 2)+21\div 7=3(10-10)+21\div 7$

$=3(0)+21\div 7$ [Substitution property]

$=0+21\div 7$ [Multiplicative property of 0]

$=0+3$ [Substitution property]

$=3$ [Additive identity property]

Answer 59MYS.

Consider the expression $12(5)-6(4)$.

The objective is to evaluate the expression.

To evaluate the expression, perform multiplication operation first.

$12(5)-6(4)$

$=60-24$ [Perform multiplication]

$=36$ [Perform subtraction]

Therefore, $12(5)-6(4)=\boxed{36}$.

Answer 60MYS.

Consider the expression $7(0.2+0.5)-0.6$.

The objective is to evaluate the expression.

To evaluate the expression, first perform addition inside the parentheses.

$7(0.2+0.5)-0.6$

$=7(0.7)-0.6$ [Perform addition]

$=4.9-0.6$ [Perform multiplication]

$=4.3$ [Perform subtraction]

Therefore, $7(0.2+0.5)-0.6=\boxed{4.3}$.

Answer 61MYS.

Consider the expression $8\left[6^2-3(2+5)\right]\div 8+3$.

The objective is to evaluate the expression.

To evaluate the expression, first simplify inside the parentheses.

$8\left[6^2-3(2+5)\right]\div 8+3$

$=8\left[6^2-3(7)\right]\div 8+3$ [Perform addition]

$=8\left[6^2-21\right]\div 8+3$ [Perform multiplication]

$=8[36-21]\div 8+3$ [Evaluate the power]

$=8[15]\div 8+3$ [Perform subtraction]

$=120\div 8+3$ [Perform multiplication from left]

$=15+3$ [Perform division]

$=18$ [Perform addition]

Therefore, $8\left[6^2-3(2+5)\right]\div 8+3=\boxed{18}$.

Answer 62MYS.

Consider the expression $2x+7$.

The objective is to evaluate the expression for $x=4$.

To evaluate the expression, substitute $x=4$ in the expression.

$2x+7=2(4)+7$

$=8+7$ [Perform multiplication]

$=15$ [Perform addition]

Therefore, the value of the expression for $x=4$ is $\boxed{15}$.

Answer 63MYS.

Consider the expression $6x+12$.

The objective is to evaluate the expression for $x=8$.

To evaluate the expression, substitute $x=4$ in the expression.

$6x+12=6(8)+12$

$=48+12$ [Perform multiplication; multiply 6 and 8]

$=60$ [Perform addition]

Therefore, the value of the expression for $x=8$ is $\boxed{60}$.

Answer 64MYS.

Consider the expression $5n-14$.

The objective is to evaluate the expression for $n=6$.

To evaluate the expression, substitute $x=4$ in the expression.

$5n-14=5(6)-14$

$=30-14$ [Perform multiplication; multiply 5 and 6]

$=16$ [Perform subtraction]

Therefore, the value of the expression for $n=6$ is $\boxed{16}$.

Answer 65MYS.

Consider the expression $3n-8$.

The objective is to evaluate the expression for $n=7$.

To evaluate the expression, substitute $n=7$ in the expression.

$3n-8=3(7)-8$

$=21-8$ [Perform multiplication; multiply 3 and 7]

$=13$ [Perform subtraction]

Therefore, the value of the expression for $n=7$ is $\boxed{13}$.

Answer 66MYS.

Consider the expression $4a+3b$.

The objective is to evaluate the expression for $a=2$ and $b=5$.

To evaluate the expression, substitute $a=2$ and $b=5$ in the expression.

$4a+3b=4(2)+3(5)$

$=8+15$ [Perform multiplication; multiply 4 and 2]

$=23$ [Perform addition]

Therefore, the value of the expression for $a=2$ and $b=5$ is $\boxed{23}$.