

Additional Examples

Lesson 1-2

1 EXAMPLE Simplify $32 + 6^2 - 14 \cdot 3$.

$$\begin{aligned}
 \cancel{32 + 6^2} - \cancel{14 \cdot 3} &= 32 + 36 - 14 \cdot 3 \\
 &= \underline{32 + 36} - 42 \\
 &= 68 - 42 \\
 &= 26
 \end{aligned}$$

Simplify the power:

$$6^2 = 6 \cdot 6 = 36.$$

Multiply 14 and 3.

Add and subtract in order from left to right.

Subtract.

2 EXAMPLE Evaluate $5x + 3^2 \div p$ for $x = 2$ and $p = 3$.

$$\begin{aligned}
 5x + 3^2 \div p &= 5 \cdot 2 + \underline{3^2} \div 3 \\
 &= \underline{5 \cdot 2} + \underline{9 \div 3} \\
 &= 10 + 3 \\
 &= 13
 \end{aligned}$$

Substitute 2 for x and 3 for p .

Simplify the power.

Multiply and divide from left to right.

Add.

3 EXAMPLE Find the total cost of a pair of jeans that cost \$32 and have an 8% sales tax.

total cost	=	original price	+	sales tax
C		p		$r \cdot p$
				sales tax rate

$$C = p + r \cdot p$$

$$= 32 + \underline{0.08 \cdot 32}$$

Substitute 32 for p . Change 8% to 0.08 and substitute 0.08 for r .

$$= 32 + 2.56$$

Multiply first.

$$= 34.56$$

Then add.

The total cost of the jeans is $\$34.56$.

4 EXAMPLE Simplify $3(8 + 6) \div (4^2 - 10)$.

$$\begin{aligned}
 3(8 + 6) \div (4^2 - 10) &= \underline{3(8 + 6)} \div \underline{(16 - 10)} \\
 &= 3(14) \div 6
 \end{aligned}$$

Simplify the power.

Simplify within parentheses.

$$= 42 \div 6$$

Multiply and divide from left to right.

$$= 7$$

Divide.

5 EXAMPLE Evaluate each expression for $x = 11$ and $z = 16$.

a. $(xz)^2$

$$\begin{aligned} (xz)^2 &= (11 \cdot 16)^2 \leftarrow \text{Substitute 11 for } x \text{ and 16 for } z. \rightarrow xz^2 = 11 \cdot 16^2 \\ &= (176)^2 \leftarrow \text{Simplify within parentheses. Multiply.} \rightarrow = 11 \cdot 256 \\ &= 30,976 \quad \leftarrow \text{Simplify.} \rightarrow = 2816 \end{aligned}$$

b. xz^2

6 EXAMPLE Simplify $4[(2 \cdot 9) + (15 \div 3)^2]$.

$$\begin{aligned} 4[(2 \cdot 9) + (15 \div 3)^2] &= 4[18 + (5)^2] && \text{First simplify } (2 \cdot 9) \text{ and } (15 \div 3). \\ &= 4[18 + 25] && \text{Simplify the power.} \\ &= 4[43] && \text{Add within brackets.} \\ &= 172 && \text{Multiply.} \end{aligned}$$

7 EXAMPLE A carpenter wants to build three decks in the shape of regular hexagons. The perimeter p of each deck will be 60 ft. The perpendicular distance a from the center of each deck to one of the sides will be 8.7 ft.

Use the formula $A = 3\left(\frac{pa}{2}\right)$ to find the total area of all three decks.

$$\begin{aligned} A &= 3\left(\frac{pa}{2}\right) \\ &= 3\left(\frac{60 \cdot 8.7}{2}\right) && \text{Substitute 60 for } p \text{ and 8.7 for } a. \\ &= 3\left(\frac{522}{2}\right) && \text{Simplify the numerator.} \\ &= 3(261) && \text{Simplify the fraction.} \\ &= 783 && \text{Multiply.} \end{aligned}$$

The total area of all three decks is 783 ft^2 .