

## 1.2 - Exponents and Order of Operations

Vocabulary:

- Simplify
- Evaluate
- Order of Operations

$$4x + 3x + 9 - 6$$

$$7x + 3$$

evaluate	
Solve	ex: $x + 5 = 11$ $-5 - 5$ $x = 6$

Parenthesis  
 Exponents  
 —————→  
 Multiply Divide  
 —————→  
 Add Subtract

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

$$\cancel{6^2 = 6 \cdot 2 = 12}$$

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

$$32 + 36 - 42$$

$$68 - 42$$

$$\boxed{26}$$

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$$\begin{aligned} \# 2. \quad & 40 - 2 \cdot 3^2 \\ & 40 - 2 \cdot 9 \\ & 40 - 18 = \boxed{22} \end{aligned}$$

$$\begin{aligned} \# 3. \quad & 8 + 12 \div 6 - 3 \\ & 8 + 2 - 3 \\ & 10 - 3 = \boxed{7} \end{aligned}$$

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

$$5 \cdot 2 + 3^2 \div 3$$

$$10 + 9 \div 3$$

$$10 + 3$$

$$\boxed{13}$$

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Evaluate each expression for  $a = 5$ ,  $b = 12$ , and  $c = 2$ .

#9.  $b^2 - 4a$

$$12^2 - 4 \cdot 5 = \boxed{124}$$
$$144 - 20 = \boxed{124}$$

# 11.  $abc + ab$

$$5 \cdot 12 \cdot 2 + 5 \cdot 12$$

$$120 + 60$$

$$\boxed{180}$$

**3 EXAMPLE**

Find the total cost of a pair of jeans if the price is \$32 and the sales tax rate is 8%.

$$8\% \rightarrow 0.08$$

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

$$= 32 + 0.08 \cdot 32$$

$$= 32 + 2.56$$

$$= \$34.56$$

$$100\% + 8\%$$

$$108\% \text{ of } \$32$$

$$= 1.08 \cdot 32$$

$$= \$34.56$$

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#13. The equation  $s = p - 0.15p$  represents the sale price  $s$  of an item with an original price  $p$ , after a 15% discount. Make a table to find the discount prices for items with original prices of \$12, \$16, \$20, and \$25.

$P$	$S = p - 0.15p$	$S$
12	$12 - (0.15 \cdot 12)$	\$10.20
16	$16 - (0.15 \cdot 16)$	\$13.60
20	$20 - (0.15 \cdot 20)$	\$17
25	$25 - (0.15 \cdot 25)$	\$21.25

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



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Simplify each expression:

$$\#17. (2 + 9) \cdot (8 - 4)$$

$$\#19. 17 - 5^2 \div (2^4 + 3^2)$$

**5 EXAMPLE**

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

**a.**  $(xz)^2$

**b.**  $xz^2$

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Evaluate each expression for  $s = 11$  and  $v = 8$ .

# 21.  $sv^2$

# 22.  $(sv)^2$

# 23.  $s^2 + v^2$

# 24.  $(s + v)^2$

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

$$4 \cdot [18 + 5^2]$$

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Simplify each expression.

$$\# 32. \quad 1'' + 3 \left[ \left( \frac{22}{11} + 8 \right) \div 5 \right]$$

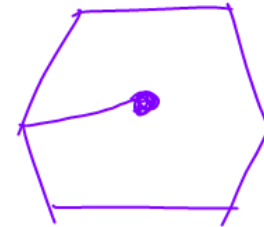
$$\# 33 \quad 27 \left[ 5^2 \div (4^2 - 3^2) + 2 \right]$$

**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.

$$A = 3 \left( \frac{pa}{2} \right)$$



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Evaluate the formula  $V = \frac{Bh}{3}$  for each pair of values.

$$\# 37. B = 7f^2 \quad h = 9f$$

$$\# 39 \quad B = 500f^2 \quad h = 90f$$

Homework Problems:

pg. 13-15 #43, 47, 49, 53, 61, 82