

Hi.

Quizzes have been graded, answer key is on the whiteboard.

After grabbing your quiz, open your books to page 7!

### Example 1 Evaluate Algebraic Expressions

Evaluate  $m + (p - 1)^2$  if  $m = 3$  and  $p = -4$ .

$$m + (p - 1)^2 = 3 + (-4 - 1)^2 \quad \text{Replace } m \text{ with } 3 \text{ and } p \text{ with } -4.$$

$$= 3 + (-5)^2 \quad \text{Add } -4 \text{ and } -1.$$

$$= 3 + 25 \quad \text{Evaluate } (-5)^2.$$

$$= 28 \quad \text{Add } 3 \text{ and } 25.$$

**Example 1** Evaluate each expression if  $a = -2$ ,  $b = 3$ , and  $c = 4.2$ .

1.  $a - 2b + 3c$  **4.6**

2.  $2a + (b + 3)^2$  **32**

3.  $a + 3[b^2 - (a + c)]$  **18.4**

$$\underline{-2} - 2(\underline{3}) + 3(\underline{4.2})$$

## Example 2 Evaluate Algebraic Expressions

a. Evaluate  $a + b^2(b - a)$  if  $a = 5$  and  $b = -3.2$ .

$$\begin{aligned}
 a + b^2(b - a) &= 5 + (-3.2)^2(-3.2 - 5) && a = 5 \text{ and } b = -3.2 \\
 &= 5 + (-3.2)^2(-8.2) && \text{Subtract 5 from } -3.2. \\
 &= 5 + 10.24(-8.2) && \text{Evaluate } (-3.2)^2. \\
 &= 5 + (-83.968) && \text{Multiply 10.24 and } -8.2. \\
 &= -78.968 && \text{Add 5 and } -83.968.
 \end{aligned}$$

b. Evaluate  $\frac{x^4 - 3wy}{y^3 + 2w}$  if  $w = 4$ ,  $x = -3$ , and  $y = -5$ .

$$\begin{aligned}
 \frac{x^4 - 3wy}{y^3 + 2w} &= \frac{(-3)^4 - 3(4)(-5)}{(-5)^3 + 2(4)} && w = 4, x = -3, \text{ and } y = -5 \\
 &= \frac{81 - 3(4)(-5)}{-125 + 2(4)} && \text{Evaluate the numerator and denominator separately.} \\
 &= \frac{81 - (-60)}{-125 + 8} && \text{Multiply in the numerator and denominator.} \\
 &= \frac{141}{-117} \text{ or } -\frac{47}{39} && \text{Simplify the numerator and denominator.} \\
 &&& \text{Then simplify the fraction.}
 \end{aligned}$$

Evaluate each expression if  $a = -2$ ,  $b = 3$ , and  $c = 4.2$ .

### Example 2

4.  $5c - 2[(b - a) + c]$  **2.6**

5.  $4(2a + 3b) - 2c$  **11.6**

6.  $\frac{a^2 + 4c}{3b + 2a}$  **4.16**

7.  $\frac{b^3 + ac}{ab + 2bc}$  **0.96875**

8.  $\frac{3b + 2a}{5 - c}$  **6.25**

9.  $\frac{3a - 2c}{4ab}$  **0.6**

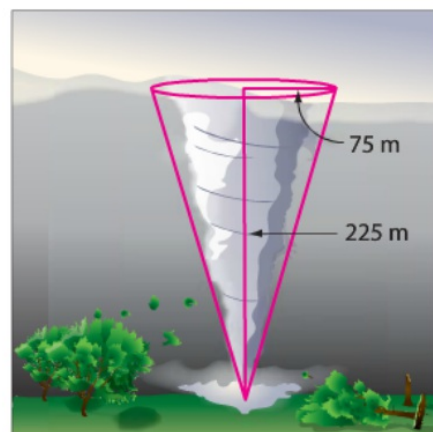
$$\begin{aligned}
 &3^3 + (-2)(4.2) \\
 &\hline
 &(-2)(3) + 2(3)(4.2)
 \end{aligned}$$

### Real-World Example 3 Use a Formula

**TORNADOES** The formula for the volume of a cone,  $V = \frac{1}{3}\pi r^2 h$ , can be used to approximate the volume of a tornado. Find the approximate volume of the tornado at the right.

$$\begin{aligned} V &= \frac{1}{3}\pi r^2 h && \text{Volume of a cone} \\ &= \frac{1}{3}\pi(75)^2(225) && r = 75 \text{ and } h = 225 \\ &= \frac{1}{3}\pi(5625)(225) && \text{Evaluate } 75^2. \\ &\approx 1,325,359 && \text{Multiply.} \end{aligned}$$

The approximate volume of the tornado is about 1,325,359 cubic meters.



### Example 3

**10. VOLLEYBALL** A player's attack percentage  $A$  is calculated using the formula  $A = \frac{k - e}{t}$ , where  $k$  represents the number of kills,  $e$  represents the number of attack errors including blocks, and  $t$  represents the total attacks attempted. Find the attack percentage given each set of values.

a.  $k = 22, e = 11, t = 35$   
about **0.314** or **31.4%**

b.  $k = 33, e = 9, t = 50$  **0.48** or **48%**

**Example 1** Evaluate each expression if  $w = -3$ ,  $x = 4$ ,  $y = 2.6$ , and  $z = \frac{1}{3}$ .

11.  $y + x - z$   $6\frac{4}{15}$

12.  $w - 2x + y \div 2$   $-9.7$

13.  $4(x - w)$   $28$

14.  $6(y + x)$   $39.6$

15.  $9z - 4y + 2w$   $-13.4$

16.  $3y - 4z + x$   $10\frac{7}{15}$

17. **GAS MILEAGE** The gasoline used by a car is measured in miles per gallon and is related to the distance traveled by the following formula.

$$\text{miles per gallon} \times \text{number of gallons} = \text{distance traveled}$$

- a. During a trip your car used a total of 46.2 gallons of gasoline. If your car gets 33 miles to the gallon, how far did you travel?  $1524.6$  mi
- b. Your friend has decided to buy a hybrid car that gets 60 miles per gallon. The gasoline tank holds 12 gallons. How far can the car go on one tank of gasoline?  $720$  mi

**Example 2**

Evaluate each expression if  $a = -4$ ,  $b = -0.8$ ,  $c = 5$ , and  $d = \frac{1}{5}$ .

18.  $\frac{a+b}{c-d} = -1$

19.  $\frac{a-b}{bd} = 20$

20.  $\frac{ac}{d+b} = 33\frac{1}{3}$

21.  $\frac{b^2c^2}{ad} = -20$

22.  $\frac{b+6}{4(d+c)} = 0.25$

23.  $\frac{5(d+a)}{2ab^2} \approx 3.71$

**24b. Yes;**  
**Sample**  
**answer:**  
**98.6°F =**  
**37°C, so a**  
**temperature**  
**above 37°C**  
**indicates a**  
**fever.**

24. **CCSS SENSE-MAKING** The formula  $C = \frac{5(F - 32)}{9}$  can be used to convert temperatures in degrees Fahrenheit to degrees Celsius.

- Room temperature commonly ranges from 64°F to 73°F. Determine the room temperature range in degrees Celsius. **17.8°C to 22.8°C**
- The normal average human body temperature is 98.6°F. A temperature above this indicates a fever. If your temperature is 42°C, do you have a fever? Explain your reasoning.

**Example 3**

25. **GEOMETRY** The formula for the area  $A$  of a triangle with height  $h$  and base  $b$  is  $A = \frac{1}{2}bh$ . Write an expression to represent the area of the triangle.  **$\frac{1}{2}(x+7)(2x)$**

