

Multiple Choice: Circle the letter of the correct answer. Show all necessary work in the space provided.

1. Bob buys eggs and potatoes at a store.

$$5x + 2.57 = 25.92$$

$$\quad \quad \quad -2.57 \quad -2.57$$

- He pays a total of \$25.92.
- He pays \$2.57 for the eggs.
- He buys 5 bags of potatoes that each cost the same amount.

$$\frac{5x}{5} = \frac{(25.92 - 2.57)}{5}$$

$$x = (25.92 - 2.57) \div 5$$

Which equation can be used to determine the cost,  $x$ , of each bag of potatoes?

- A.  $x = (25.92 - 2.57) \div 5$                       B.  $x = 25.92 \div 5 + 2.57$   
 C.  $x = (25.92 + 2.57) \div 5$                       D.  $x = 25.92 \div 5 - 2.57$

2. Which expression can go in the blank to make the equation true?

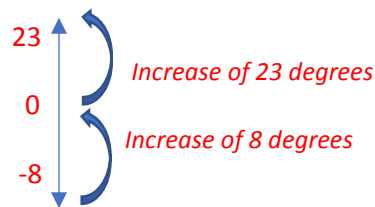
$$-4.5 + 4.4 + \underline{\hspace{2cm}} = 0 \quad \begin{array}{l} -4.5 + 4.4 + ? = 0 \\ \quad \quad \quad -0.1 \\ \quad \quad \quad -0.1 + ? = 0 \end{array}$$

- A.  $-6.7 + 6.8$                       B.  $-6.7 + (-6.6)$   
     0.1                                      -13.3  
 C.  $7.2 + (-7.2)$                       D.  $7.2 + (-7.3)$   
     0    -0.1

$? = 0.1$  because  $-0.1 + 0.1 = 0$

3. At midnight, the temperature was  $-8^{\circ}\text{F}$ . At noon, the temperature was  $23^{\circ}\text{F}$ . Which expression represents the increase in temperature?

- A.  $-8 - 23$                       B.  $|-8| - 23$   
      $-8 + (-23)$                        $8 - 23$   
     -31                                       $8 + (-23)$   
     -15  
 C.  $-8 - |23|$                       D.  $|-8 - 23|$   
      $-8 - 23$                                $|-8 + (-23)|$   
      $-8 + (-23)$                                $|-31|$   
     -31    31



Total Increase:  $8 + 23 = 31$  degrees  
 Increase in temperature is a positive value

4. What is the value of  $n$  in the equation shown below?

$$2^2 \times 2^n = (2^4)^3$$

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$$2^2 \times 2^n = 2^{12}$$

$$2^{2+n} = 2^{12}$$

$$2^{2+10} = 2^{12}$$

Exponent Rules:

$$(a^m)^n = a^{m \times n}$$

$$a^m \times a^n = a^{m+n}$$

- A. 5                      B. 6  
 C. 10                      D. 12

5. Which expression is equivalent to the expression shown below?

$$-\frac{1}{3}(6x + 15) - 3 \quad \text{1st Step: Distribute } -\frac{1}{3} \text{ to } 6x \text{ and } 15$$

- A.  $-2x + 12$   $-2x - 5 - 3$   $-\frac{1}{3} \cdot \frac{6}{1}x = -\frac{6}{3}x = -2x$
- B.  $-2x + 2$   $-2x - 5 + (-3)$
- C.  $-2x - 2$   $-2x - 8$   $-\frac{1}{3} \cdot \frac{15}{1} = -\frac{15}{3} = -5$
- D.**  $-2x - 8$
- 

6. What is the solution to the equation below?

- A.**  $c = -4\frac{2}{3}$   $5c + 4 = 2(c - 5)$
- B.  $c = -3$   $5c + 4 = 2c - 10$
- C.  $c = -2$   $-2c \quad -2c$
- D.  $c = -\frac{1}{3}$   $3c + 4 = -10$
- $-4 \quad -4$
- $\frac{3c = -14}{3 \quad 3}$
- $c = -4\frac{2}{3}$
- 

7. The mass of a dust particle is approximately  $8 \times 10^{-10}$  kilograms and the mass of an electron is approximately  $1 \times 10^{-30}$  kilograms. Approximately how many electrons have the same mass as one dust particle?

*To solve this problem, replace the numbers that are written in scientific notation with "friendly numbers". Recognize that  $8 \times 10^{-10}$  is a larger number than  $1 \times 10^{-30}$ .*

- A.**  $8 \times 10^{20}$
- B.  $8 \times 10^{21}$
- C.  $8 \times 10^{-40}$
- D.  $1.25 \times 10^{-21}$

**Example:** Mass of one dust particle = 10 kg  
 Mass of one electron is = 5 kg  
 How many electrons have the same mass as one dust particle?  
 Answer: 2 electrons because  $10 \div 5 = 2$

**Divide the mass of one dust particle by the mass of one electron.**

$$\frac{8 \times 10^{-10}}{1 \times 10^{-30}} = \frac{8}{1} \times \frac{10^{-10}}{10^{-30}} = 8 \times 10^{-10 - (-30)} = 8 \times 10^{20}$$

$-10 + 30$

**Extended Response: Show all necessary work.**

8. **Factor** the expression  $50y^3 + 75xy^5$  by factoring out the GCF.

**GCF:**  $25y^3$   $\frac{50y^3}{25y^3} + \frac{75xy^5}{25y^3}$  Factor means to create a product (*multiplication problem*)

$2 + 3xy^2$

**Factored Form:  $25y^3(2 + 3xy^2)$**

9. Determine the **smallest integer** that makes  $-3x + 7 - 5x < 15$  true.

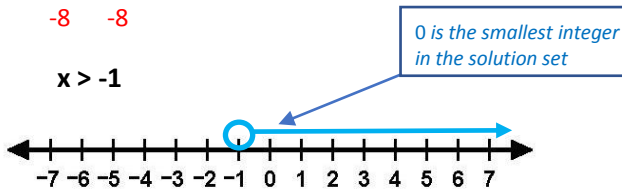
$$-3x + 7 - 5x < 15$$

$$-8x + 7 < 15$$

$$\begin{array}{r} -7 \\ -7 \end{array}$$

$$\frac{-8x < 8}{-8 \quad -8}$$

$$x > -1$$



**The smallest integer that x could represent is 0.**

10. Ben earns \$10 per hour and \$6 for each delivery he makes. He wants to earn more than \$155 in an 8-hour workday. What is the **least** number of deliveries he must make to reach his goal?

a) Write an inequality to model the situation. Use **d** to represent the number of deliveries.

Money earned in 8 hours

The total amount of money earned from the 8-hour work day and the deliveries has to be more than \$155

Money earned after making d number of deliveries

$$10(8) + 6d > 155$$

$$10(8) + 6d > 155$$

b) Solve your inequality.

$$10(8) + 6d > 155$$

$$80 + 6d > 155$$

$$\begin{array}{r} -80 \\ -80 \end{array}$$

$$\frac{6d > 75}{6 \quad 6}$$

$$d > 12.5$$

c) What is the **least number of deliveries** Ben can make to reach his goal?

**Ben can make 13 deliveries at the very least and reach his goal.**

**Check**

$$\$6(13 \text{ deliveries}) = \$78$$

$$8 \text{ hour work day} = \$80$$

$$\$78 + \$80 = \$158$$

$$\$158 > \$155$$