

1. Which of the following is not an equation?

a)  $x^2 - 16 = 0$

b)  $5(x - 2) = 15$

c)  $3x + 7 = 2x - 1$

d)  $8x - 4$

2. Translate each of the following:

a) Twenty subtracted from eight times a number  $\frac{8x - 20}{\quad}$

b) Twice the difference of a number and five  $\frac{2(x - 5)}{\quad}$

c) The sum of three times a number and twelve divided by nine  $\frac{3x + 12}{9}$

3. On January 2nd, from 10am until 3pm, the temperature rose from  $-25^\circ F$  to  $40^\circ F$ . What was the total increase in temperature during this time period?

$40 - (-25) = 65^\circ F$

4. If the expression  $(5 - 3)^2 \div 4 + 2$  is evaluated, what operation would be done last?

Adding

5. Determine if each number is rational or irrational.

a)  $\sqrt{7}$   
I

b)  $\sqrt{16}$   
R

c) 0.1111  
R

d)  $4\pi$   
I

e)  $\frac{9}{10}$   
R

f) 1.4738  
R

6. The eighth grade students are going to the theater. The cost of an adult ticket is \$15 and the cost of a student ticket is \$8.50. If the number of adult tickets sold is represented by 'a' and student tickets sold by 's', write an expression that represents the amount of money collected at the theater door from the ticket sales.

$15a + 3.50s$

7. Describe the error that was made when solving.

$2(x + 5) - 10 = 16$   
 $2x + 10 - 10 = 16$   
 $2x + 20 = 16$  *error*  
 $\frac{-20 \quad -20}{\quad}$   
 $2x = -4$   
 $\frac{2 \quad 2}{\quad}$   
 $x = -2$

8. Translate each of the following into an equation and solve.

a) Thirty more than seven times a number is 58.

$7x + 30 = 58$   
 $\frac{-30 \quad -30}{\quad}$   
 $7x = 28$

$x = 4$

b) Five times a number minus twelve is 98.

$$5n - 12 = 98$$

$$5n = 110$$

$$\boxed{n = 22}$$

c) Half a number added to thirteen is -76.

$$\frac{1}{2}x + 13 = -76$$

$$\frac{1}{2}x = -89$$

$$\boxed{x = -178}$$

d) Eighty six less than twice a number is 44.

$$2x - 86 = 44$$

$$2x = 130$$

$$\boxed{x = 65}$$

9. If A and B are represented by the expressions below, what is the value of  $5A + B$ ?

$$A = 3x - 5$$

$$B = 2x + 4$$

$$5(3x - 5) + 2x + 4$$

$$15x - 25 + 2x + 4$$

$$\boxed{17x - 21}$$

10. If C and D are represented by the expression below, what is the value of  $C - 2D$ ?

$$C = 7x + 9$$

$$D = 5x - 1$$

$$7x + 9 - 2(5x - 1)$$

$$7x + 9 - 10x + 2$$

$$\boxed{-3x + 11}$$

11. Solve for h.

$$\frac{2}{7}A = \frac{1}{2}h(b_1 + b_2) \cdot \frac{1}{1}$$

$$\frac{2A}{b_1 + b_2} = \frac{h(b_1 + b_2)}{b_1 + b_2}$$

$$\boxed{h = \frac{2A}{b_1 + b_2}}$$

12. Solve for w.

$$P = 2L + 2W$$

$$\frac{P - 2L}{2} = \frac{2W}{2}$$

$$\frac{P - 2L}{2} = \frac{2W}{2}$$

$$\boxed{W = \frac{P - 2L}{2}}$$

13. Solve for x in each of the following equations.

a)  $ax + c = d$

$$\frac{ax}{a} = \frac{d - c}{a}$$

$$\boxed{x = \frac{d - c}{a}}$$

b)  $\frac{2(x - k)}{2} = \frac{m}{2}$

$$x - k = \frac{m}{2}$$

$$x = \frac{m}{2} + k$$

$$\boxed{x = \frac{m}{2} + k}$$

c)  $ax + h = cx - p$

$$\frac{-cx}{a - c} = \frac{-p - h}{a - c}$$

$$x = \frac{-p - h}{a - c}$$

$$\boxed{x = \frac{-p - h}{a - c}}$$

d)  $5(x + h) = 2x + y$

$$\frac{5x + 5h}{-2x} = \frac{2x + y}{-2x}$$

$$3x + 5h = y - 5h$$

$$\frac{3x}{3} = \frac{y - 10h}{3}$$

$$\boxed{x = \frac{y - 10h}{3}}$$

14. Is the product of  $\sqrt{13}$  and  $\frac{2}{3}$  rational or irrational? Explain.

Irrational b/c the product cannot be written as a fraction

15. Is the sum of  $\frac{1}{2}$  and  $\sqrt{49}$  rational or irrational? Explain.

rational b/c the sum can be written as a fraction.

16. Walmart sells M&M's that come with 240 in each package. Tara already has 400 M&M's at her house. The number of M&M's =  $240m + 400$ , where  $m$  is the number of packages of M&M's purchased. If Tara wants to have 5,000 M&M's, how many packages should be purchased?

$$\begin{array}{r} 5000 = 240m + 400 \\ -400 \qquad -400 \\ \hline 4600 = 240m \\ \frac{4600}{240} = \frac{240m}{240} \end{array}$$

$$m = 19.1\bar{6}$$

19 packages

17. Billy wants to buy a new computer that will cost \$750. He comes up with an equation that represents how much he needs to save each week as follows:  $15w + 300 = 750$  If  $w$  represents the number of weeks spent saving, how many weeks will it take Billy to save \$750?

$$\begin{array}{r} 15w + 300 = 750 \\ -300 \quad -300 \\ \hline 15w = 450 \\ \frac{15w}{15} = \frac{450}{15} \end{array}$$

$$w = 30 \text{ weeks}$$

18. Solve for  $x$  algebraically for each of the following.

a)  $4(x - 2) + 10 = 26$

$$\begin{array}{r} 4x - 8 + 10 = 26 \\ 4x + 2 = 26 \\ 4x = 24 \\ \boxed{x = 6} \end{array}$$

b)  $-5(x - 3) = -2(x - 6)$

$$\begin{array}{r} -5x + 15 = -2x + 12 \\ +5x \qquad +5x \\ \hline 15 = 3x + 12 \\ -12 \quad -12 \\ \hline 3 = 3x \\ \boxed{x = 1} \end{array}$$

c)  $\frac{1}{2}(8x - 16) = 2(x + 4)$

$$\begin{array}{r} 4x - 8 = 2x + 8 \\ -2x + 8 \quad -2x + 8 \\ \hline 2x = 16 \\ \boxed{x = 8} \end{array}$$

d)  $-7x + 10 + x = \frac{1}{3}(9x + 12) + 24$

$$\begin{array}{r} -6x + 10 = 3x + 4 + 24 \\ -6x + 10 = 3x + 28 \\ -3x - 10 \quad -3x - 10 \\ \hline -9x = 18 \\ \boxed{x = -2} \end{array}$$