

# Review for Test #3 - Algebraic Linear Equations

Name: \_\_\_\_\_ Class: \_\_\_\_\_

- 1.) What is another way of saying that an equation has infinite solutions? identity
- 2.) What is another way of saying that an equation has no solution? null set
- 3.) Find three consecutive integers whose sum is -87.

Let 1<sup>st</sup> int =  $x$

Let 2<sup>nd</sup> int =  $x+1$

Let 3<sup>rd</sup> int =  $x+2$

$$x + x + 1 + x + 2 = -87$$

$$3x + 3 = -87$$

$$3x = -90$$

$$x = -30$$

$$\boxed{-30, -29, -28}$$

- 4.) Find three consecutive even integers such that three times the sum of the first and the third is 24 more than two times the second.

Let 1<sup>st</sup> even int =  $x$

Let 2<sup>nd</sup> even int =  $x+2$

Let 3<sup>rd</sup> even int =  $x+4$

$$3(x + x + 4) = 2(x + 2) + 24$$

$$3x + 3x + 12 = 2x + 4 + 24$$

$$6x + 12 = 2x + 28$$

$$4x + 12 = 28$$

$$4x = 16$$

$$x = 4$$

$$\boxed{4, 6, 8}$$



Solve the following equations:

5.)  $7x + 2 = 5x - 10$

$$2x + 2 = -10$$

$$2x = -12$$

$$\boxed{x = -6}$$

6.)  $3p + 4 = 3(p + 1)$

$$3p + 4 = 3p + 3$$

$$\emptyset$$

$$7.) \quad 5h + 3 - 2h + 4 = 2h + 9 + h - 2$$

$$3h + 7 = 3h + 7$$

$\infty$  solutions

$$8.) \quad 5 \cdot \frac{x-6}{5} = 14 \cdot 5$$

$$x - 6 = 70$$

$$\boxed{x = 76}$$

$$9.) \quad 0.2(x + 50) - 6 = 0.4(3x + 20)$$

$$0.2x + 10 - 6 = 1.2x + 8$$

$$0.2x + 4 = 1.2x + 8$$

$$\begin{array}{r} -0.2x \quad -0.2x \\ \hline \end{array}$$

$$4 = 1x + 8$$

$$\begin{array}{r} -8 \quad -8 \\ \hline \end{array}$$

$$\boxed{-4 = x}$$

$$10.) \quad 10p - 2(3p - 6) = 4(3p - 6) - 8p$$

$$10p - 6p + 12 = 12p - 24 - 8p$$

$$4p + 12 = 4p - 24$$

$$\begin{array}{r} -4p \quad -4p \\ \hline \end{array}$$

$$12 = -24$$

$\emptyset$

$$11.) \quad -27 - 15 = -12h + 4h - 3 + 15 - h$$

$$-42 = -9h + 12$$

$$\begin{array}{r} -12 \quad -12 \\ \hline \end{array}$$

$$-54 = -9h$$

$$\begin{array}{r} -9 \quad -9 \\ \hline \end{array}$$

$$\boxed{6 = h}$$

$$12.) \quad \frac{3x}{4} + \frac{x \cdot 12}{3} = \frac{13}{6} \cdot 12$$

$$3(3x) + 4(x) = 2(13)$$

$$9x + 4x = 26$$

$$13x = 26$$

$$\boxed{x = 2}$$



$$13.) 8 - 3y = 35$$

$$\begin{array}{r} -8 \quad -8 \\ \hline -3y = 27 \\ -\frac{3}{-3} \quad -\frac{3}{-3} \\ \hline \boxed{y = -9} \end{array}$$

$$15.) 1.2x + 37 = 4.2x - 8$$

$$\begin{array}{r} -1.2x \quad -1.2x \\ \hline 37 = 3x - 8 \\ +8 \quad +8 \\ \hline 45 = 3x \\ \frac{45}{3} = \frac{3x}{3} \\ \hline \boxed{15 = x} \end{array}$$

$$\frac{2}{3}(x-9) = -4(x-5) - 12$$

$$3 \cdot \frac{2}{3}x - 6 \cdot 3 = -4x + 20 - 12 \cdot 3$$

$$14.) 2x - 18 = -12x + 60 - 36$$

$$\begin{array}{r} 2x - 18 = -12x + 24 \\ +12x \quad +12x \\ \hline 14x - 18 = 24 \\ +18 \quad +18 \\ \hline 14x = 42 \\ \frac{14x}{14} = \frac{42}{14} \\ \hline \boxed{x = 3} \end{array}$$

$$8. \frac{3x-2}{8} + \frac{2-x}{4} = -\frac{1}{2} \cdot 8$$

$$1(3x-2) + 2(2-x) = 4(-1)$$

$$\begin{array}{r} 3x - 2 + 4 - 2x = -4 \\ x + 2 = -4 \\ -2 \quad -2 \\ \hline \boxed{x = -6} \end{array}$$

17.) Matthew has a cousin who is five years older than he is. The sum of their ages is 31. How old is Matthew's cousin?

$$\text{Let Matt's age} = x$$

$$\text{Let cousin's age} = x + 5$$

$$x + x + 5 = 31$$

$$2x + 5 = 31$$

$$-5 \quad -5$$

$$\hline 2x = 26$$

$$\frac{2x}{2} = \frac{26}{2}$$

$$\boxed{x = 13}$$

18.) Leah and Alexis went shopping and spent a total of \$32.50. Alexis spent \$9.50 more than Leah did. How much did they each spend?

$$\text{Let Leah's amount} = x$$

$$\text{Let Alexis' amount} = x + 9.5$$

$$x + x + 9.5 = 32.5$$

$$2x + 9.5 = 32.5$$

$$-9.5 \quad -9.5$$

$$\hline 2x = 23$$

$$\frac{2x}{2} = \frac{23}{2}$$

$$\text{Leah} = \$11.50$$

$$\text{Alexis} = \$11.50 + 9.50 = \$21$$

For 19 – 22, isolate  $y$ .

19.)  $y - 5 = 2x$

$$\begin{array}{r} +5 \quad +5 \\ \hline y = 2x + 5 \end{array}$$

20.)  $\frac{3y}{3} = \frac{9x}{3} - \frac{12}{3}$

$$y = 3x - 4$$

21.)  $x - y = 7$

$$\begin{array}{r} +y \quad +y \\ \hline x = 7 + y \\ -7 \quad -7 \\ \hline x - 7 = y \end{array}$$

22.)  $3x - 2y = 9$

$$\begin{array}{r} -2y = -3x + 9 \\ \hline y = \frac{3}{2}x - 3 \end{array}$$

**Answers:**

1.) identity

3.) -30, -29, -28

5.)  $x = -6$

7.) infinite solutions

9.)  $x = -2$

11.)  $h = 6$

13.)  $y = -9$

15.)  $x = 15$

17.) 18 yrs.

19.)  $y = 2x + 5$

21.)  $y = x - 7$

2.) null set

4.) 4, 6, 8

6.) no solutions

8.)  $x = 76$

10.) no solutions

12.)  $x = 2$

14.)  $x = 3$

16.)  $x = -6$

18.) Adam: \$11.50; Alexis: \$21

20.)  $y = 3x - 4$

22.)  $y = \frac{3}{2}x - 4$

