

Unit 6 Test Review

Name _____

Date _____

Solve each problem showing every step. Graph the inequalities. The problems with ** are challenge problems. Try them!

A

1) $b + 10 - 3 = 44 \div 2$

1) $b + 10 - 3 = 44 \div 2$

$$\begin{array}{r} b + 7 = 22 \\ -7 \quad -7 \end{array}$$

$b = 15$

A

2) $n - 8 = 24$

2) $n - 8 = 24$

$$\begin{array}{r} +8 \quad +8 \end{array}$$

$n = 32$

A

3) $h - 6 = 32$

3) $h - 6 = 32$

$$\begin{array}{r} +6 \quad +6 \end{array}$$

$h = 38$

A

4) $-25 = j + 5$

4) $-25 = j + 5$

$$\begin{array}{r} -5 \quad -5 \end{array}$$

$$-30 = j$$

$j = -30$

A

5) $a - (-11) = -14$

5) $a - (-11) = -14$

$$\begin{array}{r} a + 11 = -14 \\ -11 \quad -11 \end{array}$$

$a = -25$

A) 6) $-29 + t = -16$

$$\begin{array}{r} 6) -29 + t = -16 \\ +29 \quad +29 \end{array}$$

$t = 13$

B) 7) $5\frac{1}{3} + g - 2\frac{1}{6} = -9$

$$\begin{array}{r} 7) 5\frac{1}{3} + g - 2\frac{1}{6} = -9 \\ \frac{19}{6} + g = -9 \\ \frac{-19}{6} \quad \frac{-19}{6} \\ \hline g = -\frac{73}{6} = -12\frac{1}{6} \end{array}$$

$$\begin{array}{r} \rightarrow 5\frac{1}{3} - 2\frac{1}{6} \\ \frac{16}{3} - \frac{13}{6} \\ \frac{32}{6} - \frac{13}{6} = \frac{19}{6} \\ \frac{19}{6} - 9 = \frac{19}{6} - \frac{54}{6} = \frac{-35}{6} \end{array}$$

A) 8) $-9 - (-r) = 12$

$$\begin{array}{r} 8) -9 - (-r) = 12 \\ -9 + r = 12 \\ +9 \quad +9 \\ \hline r = 21 \end{array}$$

$r = 21$

B) 9) $-5 = 4s + 6\frac{1}{3}$

$$\begin{array}{r} 9) -5 = 4s + 6\frac{1}{3} \\ -6\frac{1}{3} \quad -6\frac{1}{3} \\ \hline -\frac{34}{3} = 4s \\ \frac{-34}{3} \div 4 = \frac{-34}{12} = \frac{-17}{6} \\ s = \frac{17}{6} = 2\frac{5}{6} \end{array}$$

$$\begin{array}{r} \rightarrow -5 - 6\frac{1}{3} \\ -5 - \frac{19}{3} = \frac{-15}{3} - \frac{19}{3} \\ \frac{-34}{3} \div \frac{4}{1} = \frac{-34}{12} = \frac{-17}{6} \end{array}$$

A) 10) $\frac{4}{5}y = -72$

$$\begin{array}{r} 10) \frac{4}{5}y = -72 \\ \times \frac{5}{4} \\ \hline y = -90 \end{array}$$

$y = -90$

A) 11) $22 = \frac{r}{36}$

$$11) 36 \times 22 = \frac{r}{36} \times 36$$

$r = 792$

A 12) $-15n = 75$

$$12) \frac{-15n}{-15} = \frac{75}{-15}$$

$$n = -5$$

B 13) $2v + 47.8 = -18.3$

$$13) \begin{array}{r} 2v + 47.8 = -18.3 \\ - 47.8 \quad -47.8 \\ \hline \end{array}$$

$$\frac{2v}{2} = \frac{-66.1}{2}$$

$$v = -33.05$$

A 14) $18 = -\frac{4}{9}m$

$$14) \frac{-9}{4} \times 18 = -\frac{4}{9}m \times \frac{-9}{4}$$

$$m = \frac{-9}{24} \cdot \frac{18}{1} = m = \frac{-81}{2} = -40\frac{1}{2}$$

A 15) $-3.72y = 5.208$

$$15) \begin{array}{r} -3.72y = 5.208 \\ -3.72 \quad -3.72 \\ \hline \end{array}$$

$$y = -1.4$$

A 16) $\frac{1}{8}t = 19$

$$16) \frac{8}{1} \cdot \frac{1}{8}t = 19 \times \frac{8}{1}$$

$$t = 152$$

A 17) $\frac{c}{5} = -20$

17) $\frac{c}{5} = -20 \cdot 5$

$c = -100$

B 18) $\frac{1}{2}f = 17\frac{1}{3}$

18) $\frac{1}{2}f = 17\frac{1}{3} \times 2$

$f = \frac{52}{3} \cdot \frac{2}{1} = \frac{104}{3} = 34\frac{2}{3}$

$f = \frac{104}{3}$ or $34\frac{2}{3}$

A 19) $\frac{a}{2} + 3 = 6$

19) $\frac{a}{2} + 3 = 6$
 $\quad \quad \quad -3 \quad -3$

$\frac{a}{2} = 3 \times 2$

$a = 6$

B 20) $\frac{1}{4}b - (-3.5) = 19$

20) $\frac{1}{4}b - (-3.5) = 19$

$\frac{1}{4}b + 3.5 = 19.0$
 $\quad \quad \quad -3.5 \quad -3.5$

$4 \cdot \frac{1}{4}b = 15.5 \cdot 4$

$b = 62$

B 21) $-11 + \frac{d}{3} = 5$

21) $-11 + \frac{d}{3} = 5$
 $\quad \quad \quad +11 \quad \quad +11$

$\frac{d}{3} = 16 \times 3$

$d = 48$

C ** 22) $-(g-9) + 3g - 8 = 65$

22) $-(g-9) + 3g - 8 = 65$

$-g + 9 + 3g - 8 = 65$

$2g + 1 = 65$
 $\quad \quad \quad -1 \quad -1$

$2g = 64$
 $\quad \quad \quad \div 2 \quad \quad \div 2$

$g = 32$

C ** 23) $\frac{5(x-3)}{3} = \frac{2}{9}$

23) $5\frac{(x-3)}{3} = \frac{2}{9}$

$\cancel{5} \frac{5x-15}{\cancel{3}} = \frac{2}{39} \cdot \frac{3}{1}$

$5x-15 = \frac{2}{3} + \frac{15}{1} = \frac{2}{3} + \frac{45}{3}$

$\frac{1}{5} \cdot 5x = \frac{47}{3} \cdot \frac{1}{5} = \boxed{x = \frac{47}{15} \text{ or } 3\frac{2}{15}}$

B 24) $\frac{5}{7}e - \frac{2}{3} = 16$

24) $\frac{5}{7}e - \frac{2}{3} = 16 + \frac{2}{3}$

$+\frac{2}{3}$

$\frac{5}{7}e = \frac{50}{3} \cdot \frac{7}{5}, \boxed{e = \frac{70}{3} = 23\frac{1}{3}}$

C ** 25) $-12 + 4(7c - 16) = -132$

25) $-12 + 4(7c - 16) = -132$

$-12 + 28c - 64 = -132$

$-76 + 28c = -132$

$+76$

$+76$

$28c = -56$

$\boxed{c = -2}$

A 26) $x + 7 \leq -18$

26) $x + 7 \leq -18$

$-\frac{7}{7} \quad -\frac{7}{7}$

$\boxed{x \leq -25}$



A 27) $30 < 4b - 6$

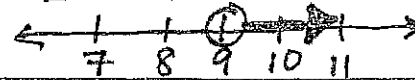
27) $30 < 4b - 6$

$+\frac{6}{6} \quad +\frac{6}{6}$

$36 < 4b$

$\frac{4b}{4} > \frac{36}{4}$

$\boxed{b > 9}$



B 28) $\frac{1}{4}(20 + x) \leq 6$

28) $\frac{1}{4}(20 + x) \leq 6$

$5 + \frac{1}{4}x \leq 6$

$-\frac{5}{5} \quad -\frac{5}{5}$

$\frac{1}{4}x \leq 1$

$\boxed{x \leq 4}$

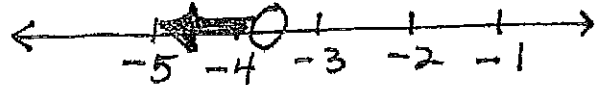


B 29) $-10 > n - 6.13$

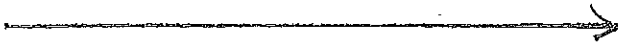


29) $-10 > n - 6.13$
 $+6.13$ $+6.13$
 $-3.87 > n$

$n < -3.87$



A 30) $\frac{2}{5}w + 7 \leq 4$

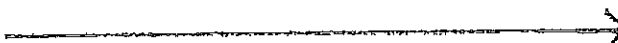


30) $\frac{2}{5}w + 7 \leq 4$
 -7 -7

$\frac{2}{5}w = -3.5$
 $w \leq \frac{-15}{2} = -7\frac{1}{2}$



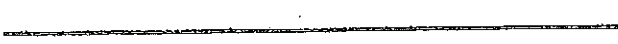
A 31) $6a < 18$



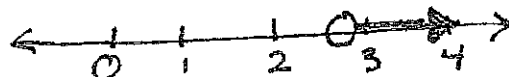
31) $\frac{6a}{6} < \frac{18}{6}$
 $a < 3$



A 32) $11k - 9 > 22$



32) $11k - 9 > 22$
 $+9$ $+9$
 $11k > 31$ $k > \frac{31}{11} = 2\frac{9}{11}$



Write an algebraic expression for each word phrase:

A 33) 7 more than a number y

33) $7 + y$

A 34) 6 times the sum of 4 and y

34) $6(4 + y)$

A 35) 11 less than a number

35) $n - 11$

36) half the sum of m and 5

$$36) \quad \frac{1}{2}(m+5)$$

37) 9 more than the product of 6 and a number

$$37) \quad 9 + 6a$$

38) 6 less than the product of 13 and a number

$$38) \quad 13x - 6$$

39) 2 less than a number divided by 8

$$39) \quad \frac{x}{8} - 2$$

40) the quotient of a number and 5

$$40) \quad \frac{n}{5}$$

41) At the Boston Aquarium there is a fish tank which has 73 fish in it. There are 3 more than 4 times as many clown fish as goldfish. How many of each type of fish are there?

$$41) \quad \begin{array}{l} \text{Let } x = \text{goldfish} \quad 14 \\ 3 + 4x = \text{Clowns} \quad 59 \end{array}$$

$$\begin{aligned} x + 3 + 4x &= 73 \\ 5x + 3 &= 73 \\ \underline{-3} \quad \underline{-3} & \\ 5x &= 70 \\ x &= 14 \end{aligned}$$

- B 42) In the North Pole there are 186 male and female penguins which were tagged. 30 less than 5 times the number of males were tagged than females. How many of each were there?

42)

$$\begin{aligned} \text{Let } x &= \text{females} = 36 \\ 5x - 30 &= \text{males} = 150 \end{aligned}$$

$$x + 5x - 30 = 186$$

$$\begin{array}{r} 6x - 30 = 186 \\ + 30 \quad + 30 \\ \hline \end{array}$$

$$6x = 216$$

$$x = 36$$

- A 43) The total weight of Sam and his son, Dan, is 250 pounds. Sam's weight is 10 pounds more than 3 times Dan's weight. How much does Dan weigh?

43) Let $x = \text{Dan's} = 60 \text{ lbs.}$

$$3x + 10 = \text{Sam's}$$

$$x + 3x + 10 = 250$$

$$\begin{array}{r} 4x + 10 = 250 \\ - 10 \quad - 10 \\ \hline \end{array}$$

$$4x = 240$$

$$x = 60$$

- 44) Gina and Mary were paid \$126.50 for babysitting over the weekend. Gina made \$18 less than 6 times as much as Mary. How much did each girl make? (round your answers to the nearest cent)

44) Let $x = \text{Mary} = \$20.64$

$$6x - 18 = \text{Gina} = \$105.86$$

$$\begin{array}{r} 7x - 18 = 126.50 \\ + 18 \quad + 18.00 \\ \hline \end{array}$$

$$7x = 144.50$$

$$x = 20.64$$

- A 45) Two consecutive numbers have a sum of 99. What are they?

$$45) \text{ Let } x = 1^{\text{st}} \rightarrow 49$$

$$x + 1 = 2^{\text{nd}} \rightarrow 50$$

$$x + x + 1 = 99$$

$$2x + 1 = 99$$

$$\underline{-1} \quad \underline{-1}$$

$$2x = 98$$

$$x = 49$$

- B 46) Three consecutive numbers have a sum of 375. What are the numbers?

$$46) \text{ Let } x = 1^{\text{st}} = 124$$

$$x + 1 = 2^{\text{nd}} = 125$$

$$x + 2 = 3^{\text{rd}} = 126$$

$$x + x + 1 + x + 2 = 375$$

$$3x + 3 = 375$$

$$\underline{-3} \quad \underline{-3}$$

$$3x = 372$$

$$x = 124$$

Solve the following multi-step equations.

- A 47) $3y + 7 = -6y - 56$

$$47) 3y + 7 = -6y - 56$$

$$\underline{-3y} \quad \underline{-3y}$$

$$7 = -9y - 56$$

$$\underline{+56} \quad \underline{+56}$$

$$63 = -9y$$

$$\underline{-9} \quad \underline{-9}$$

$$y = -7$$

- B 48) $.8k + 7 = -0.7k + 1$

$$48) .8k + 7 = -0.7k + 1$$

$$\underline{+.7k} \quad \underline{+.7k}$$

$$1.5k + 7 = 1$$

$$\underline{-7} \quad \underline{-7}$$

$$\underline{1.5k} = \underline{-6}$$

$$\underline{1.5} \quad \underline{1.5}$$

$$k = -4$$

