Unit 6 Accelerated Test Review

Solve each equation, showing all the steps and all the work! Graph the solutions for all inequalities.

Name _____

Date _____

*Challenge problems – not on the test, but give them a try!

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

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

$b+7 = 22$

$-7 \quad -7$

$\boxed{b = 15}$

2) $n - \frac{1}{8} = 24\frac{3}{4}$

2) $n - \frac{1}{8} = 24\frac{3}{4}$

$+\frac{1}{8} \quad +\frac{1}{8}$

$\boxed{n = 24\frac{7}{8}}$

$24\frac{3}{8} + \frac{1}{8}$

$24\frac{6}{8} + \frac{1}{8}$

$24\frac{7}{8}$

3) $\frac{1}{25}e + 7 = 5$

3) $\frac{1}{25}e + 7 = 5$

$-7 \quad -7$

$25 \cdot \frac{1}{25}e = -2 \cdot 25$

$\boxed{e = -50}$

4) $\frac{3}{4}w + 42.25 = 59.5$

4) $\frac{3}{4}w + 42.25 = 59.5$

$-42.25 \quad -42.25$

$\frac{.75w}{.75} = \frac{17.25}{.75}$

$\boxed{w = 23}$

5) $\frac{3}{5}r-\left(-\frac{5}{6}\right)=63$

5) $\frac{3}{5}r-\left(-\frac{5}{6}\right)=63$

$\frac{3}{5}r+\frac{5}{6}=63$ $\quad 63=62\frac{6}{6}$

$-\frac{5}{6}\quad -\frac{5}{6}$ $\quad 62\frac{6}{6}-\frac{5}{6}=$

$\frac{5}{3}\cdot\frac{3}{5}r=\frac{373}{6}\cdot\frac{5}{3}=\frac{1865}{18}=103\frac{11}{18}$ $\quad 62\frac{1}{6}=\frac{373}{6}$

---

6) $\frac{105}{5}=3(4-2b)$

6) $\frac{105}{5}=3(4-2b)$

$21=12-6b$

$-12\quad -12$

$\frac{9}{-6}=\frac{-6b}{-6}$ $\quad \boxed{b=-\frac{3}{2}}$

---

7) $-\frac{11}{20}+38t=-46\frac{5}{7}$

7) $-\frac{11}{20}+38t=-\frac{327}{7}+\frac{11}{20}$

$+\frac{11}{20}$ $\quad -\frac{6540}{140}+\frac{77}{140}$

$\frac{38t}{38}=-\frac{6463}{140}\left(\frac{1}{38}\right)$

$t=-\frac{6463}{5320}=-1\frac{1143}{5320}$

---

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

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

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

$2g+1=65$

$-1\quad -1$

$\frac{2g}{2}=\frac{64}{2}$

$\boxed{g=32}$

---

9) $18.6n-27=34.9+52.1n$

9) $18.6n-27=34.9+52.1n$

$-18.6n\qquad -18.6n$

$-27=34.9+33.5n$

$-34.9\quad -34.9$

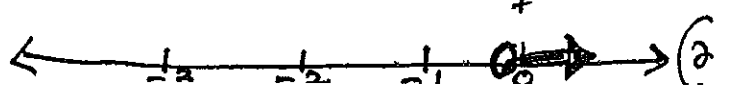
$\frac{-61.9}{33.5}=\frac{33.5n}{33.5}$ $\quad \boxed{n=-1.85}$

---

10) $-\frac{5}{8}p-\frac{1}{8}p>\frac{1}{4}\div 7$

10) $-\frac{5}{8}p-\frac{1}{8}p>\frac{1}{4}\div 7 \rightarrow \frac{1}{4}\times\frac{1}{7}=\frac{1}{28}$

$-\frac{6}{8}p>\frac{1}{28}$ $\quad \frac{4}{3}\cdot\frac{-3}{4}p>\frac{1}{28}\cdot\frac{-4}{3}=-\frac{1}{21}$



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

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

$3 \cdot 9 \cdot \frac{5x-15}{3} = \frac{2}{9} \cdot 9 \cdot 3$

$15x - 45 = 2$

$+45 \quad +45$

$15x = 47$

$x = \frac{47}{15} = 3\frac{2}{15}$

---

12) $-10x - 4[-1 - 3(3x - 2)] = 890$

12) $-10x - 4[-1 - 3(3x-2)] = 890$

$-10x - 4(-1 - 9x + 6) = 890$

$-10x + 4 + 36x - 24 = 890$

$26x - 20 = 890$

$+20 \quad +20$

$\frac{26x}{26} = \frac{910}{26}$

$x = 35$

---

13) $\frac{1}{4}(8k - 4) = \frac{1}{3}(12 - 6k)$

13) $\frac{1}{4}(8K-4) = \frac{1}{3}(12-6K)$

$2K - 1 = 4 - 2K$

$+2K \quad +2K$

$4K - 1 = 4$

$+1 \quad +1$

$\frac{4K}{4} = \frac{5}{4}$

$K = \frac{5}{4}$ or $1\frac{1}{4}$

---

14) $12 - 3(2n + 3) = -3n + 3(n + 1)$

14) $12 - 3(2n+3) = -3n + 3(n+1)$

$12 - 6n - 9 = -3n + 3n + 3$

$3 - 6n = 3$

$-3 \quad -3$

$\frac{-6n}{-6} = \frac{0}{-6}$

$n = 0$

---

15) $10\frac{1}{2} - n = 3\frac{1}{4}$

15) $10\frac{1}{2} - n = 3\frac{1}{4}$

$-10\frac{1}{2} \quad -10\frac{1}{2}$

$-n = -\frac{29}{4}$

$n = \frac{29}{4}$ or $7\frac{1}{4}$

$\frac{13}{4} - \frac{21}{2} = \frac{13}{4} - \frac{42}{4}$

---

16) $16 + 9d = -14$

16) $16 + 9d = -14$

$-16 \quad -16$

$\frac{9d}{9} = \frac{-30}{9}$

$d = -3\frac{3}{9} = -3\frac{1}{3}$

17) $-3n = 10 - 2n$

17) $-3n = 10 - 2n$
$+2n \quad +2n$
$-n = 10$
$\boxed{n = -10}$

---

18) $-4 - x = -5$

18) $-4 - x = -5$
$+4 \quad +4$
$-x = -1$
$\boxed{x = 1}$

---

19) $-5n + 6 \geq 9$

19) $-5n + 6 \geq 9$
$-6 \quad -6$
$\frac{-5n}{-5} \geq \frac{3}{-5}$ $\quad n \leq -\frac{3}{5}$

---

20) $.25x + .75(10 - x) = 3$

20) $.25x + .75(10 - x) = 3$
$.25x + 7.5 - .75x = 3$
$-.50x + 7.5 = 3$
$-7.5 \quad -7.5$
$\frac{-.5x}{-.5} = \frac{-4.5}{-.5}$ $\boxed{x = 9}$

---

* 21) $\frac{x}{5} - \frac{x}{2} = 3$

21) $\frac{x}{5} - \frac{x}{2} = 3$
$\frac{2x}{10} - \frac{5x}{10} = 3$
$10 \cdot \frac{-3x}{10} = 3 \times 10$
$-3x = 30$ $\boxed{x = -10}$

---

22) $\frac{3}{2}(z+5) - \frac{1}{4}(z+24) = 0$

22) $\frac{3}{2}(z+5) - \frac{1}{4}(z+24) = 0$
$\frac{3}{2}z + \frac{15}{2} - \frac{1}{4}z - 6 = 0$
$\frac{5}{4}z + \frac{15}{2} - 6 = 0$
$\frac{5}{4}z + \frac{3}{2} = 0$
$\frac{5}{4}z = -\frac{3}{2}$
$\frac{3}{2} - \frac{1}{4} = \frac{6}{4} - \frac{1}{4} = \frac{5}{4}$
$\frac{15}{2} - \frac{6}{1} = \frac{15}{2} - \frac{12}{2}$
$-\frac{12}{10} = \boxed{-1\frac{1}{5}}$

23) $2\frac{5}{12} = -3\frac{1}{4} + k$

$2\frac{5}{12} = -3\frac{1}{4} + K$ → $\frac{29}{12} + \frac{39}{12} = \frac{68}{12}$

$\frac{29}{12} = -\frac{13}{4} + K$

$+\frac{13}{4} \quad +\frac{13}{4}$

$\frac{68}{12} = K$

$K = \frac{68}{12} = 5\frac{8}{12} = 5\frac{2}{3}$

---

24) $-1\frac{1}{2} + v = -3\frac{3}{10}$

$-1\frac{1}{2} + V = -3\frac{3}{10}$ → $-3\frac{3}{10} + 1\frac{1}{2} =$

$+1\frac{1}{2} \quad +1\frac{1}{2}$

$-\frac{33}{10} + \frac{3}{2} = -\frac{33}{10} + \frac{15}{10}$

$V = -\frac{18}{10} = -1\frac{8}{10} = -1\frac{4}{5}$

---

25) $-\frac{9}{19} = n - 11$

$-\frac{9}{19} = n - 11$ → $-\frac{9}{19} + \frac{11}{1} = \frac{-9}{19} + \frac{209}{19}$

$+11 \quad +11$

$\frac{200}{19} = n$ $\quad n = \frac{200}{19} = 10\frac{10}{19}$

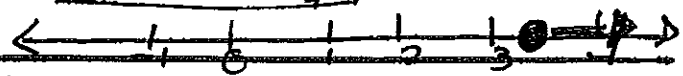
---

26) $n - \frac{4}{7} \geq 3$

$n - \frac{4}{7} \geq 3$

$+\frac{4}{7} \quad +\frac{4}{7}$

$n \geq 3\frac{4}{7}$ or $\frac{25}{7}$



---

27) $\frac{1}{3} \leq n + \frac{4}{3}$

$\frac{1}{3} \leq n + \frac{4}{3}$

$-\frac{4}{3} \quad -\frac{4}{3}$

$-\frac{3}{3} \leq n = -1 \leq n =$ $n \geq -1$

---

28) $.60x + .40(100 - x) < 50$

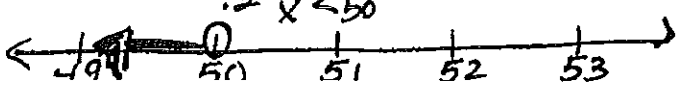
$.60x + 40 - .4x < 50$

$.2x + 40 < 50$

$-40 \quad -40$

$.2x < 10$

$\frac{.2}{.2} x < \frac{50}{.2}$



* 29) $\frac{5x}{4} + \frac{1}{2} \leq x - \frac{1}{2}$

29) $4 \cdot \frac{5x}{4} + \frac{1}{2} \cdot 4 \leq x - \frac{1}{2}$

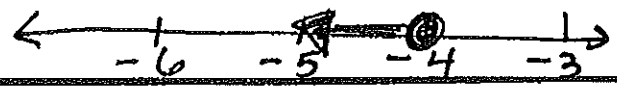
$5x + 2 \leq 4x - 2$

$-4x \quad -4x$

$x + 2 \leq -2$

$-2 \quad -2$

$x \leq -4$



30) $-5 < 4s + 6\frac{1}{3}$

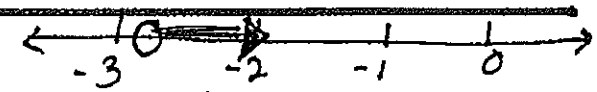
30) $-5 < 4s + 6\frac{1}{3}$

$-5 < 4s + \frac{19}{3}$ → $-\frac{5}{1} - \frac{19}{3} = -\frac{15}{3} - \frac{19}{3}$

$-\frac{19}{3} \quad -\frac{19}{3}$

$\frac{1}{4_2} \cdot -\frac{34}{3} < \frac{4s}{4}$

$-\frac{17}{6} < s$ $\quad s > -\frac{17}{6} = -2\frac{5}{6}$



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

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

$+\frac{2}{3} \quad +\frac{2}{3}$

$\frac{5}{7}e = 16\frac{2}{3}$

$\frac{7}{5} \cdot \frac{5}{7}e = \frac{50}{3} \cdot \frac{7}{5_1}$

$e = \frac{70}{3} = 23\frac{1}{3}$

32) $30 < -4b - 6$

32) $30 < -4b - 6$

$+6 \quad +6$

$\frac{36}{-4} < \frac{-4b}{-4}$

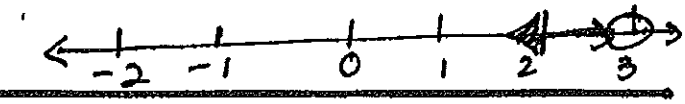
$-9 > b$

$b < -9$

33) $-6a > -18$

33) $\frac{-6a}{-6} > \frac{-18}{-6}$

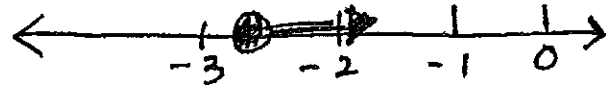
$a < 3$



34) $-\frac{3}{4}b \leq 2$

34) $-\frac{4}{3} \cdot -\frac{3}{4}b \leq 2 \cdot -\frac{4}{3}$

$b \geq -\frac{8}{3}$ $\quad b \geq -\frac{8}{3}$ or $-2\frac{2}{3}$



35) Write an algebraic expression for each word phrase.

a) 7 more than a number y

a) $7+y$

b) 6 times the sum of 4 and y

b) $6(4+y)$

c) 11 less than a number

c) $x-11$

d) half the sum of m and 5

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

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

e) $9+6a$

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

f) $13x-6$

g) 2 less than a number divided by 8

g) $\frac{x}{8}-2$

h) twice the quotient of a number and 5

h) $2\left(\frac{m}{35}\right)$ or $\frac{2m}{35}$

35) At the Boston Aquarium there is a fish tank which has 7 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?

35) Let x = goldfish → 14

$3+4x$ = clowns → 59

$x+3+4x=73$

$5x+3=73$

$-3 \quad -3$

$5x=70$

$x=14$

(7)

36) 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?

36) Let x = females = 36

$5x - 30$ = males = 150

$x + 5x - 30 = 186$

$6x - 30 = 186$

$+30 \quad +30$

$6x = 216$

$x = 36$

37) 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?

37) Let x = Dan's = 60 lbs.

$3x + 10$ = Sam's

$x + 3x + 10 = 250$

$4x + 10 = 250$

$-10 \quad -10$

$4x = 240$

$x = 60$

38) 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)

38) Let x = Mary = \$20.64

$6x - 18$ = Gina = \$105.86

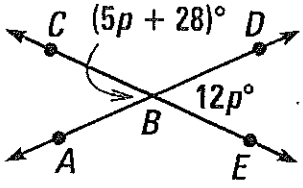
$7x - 18 = 126.50$

$+18 \quad +18.00$

$7x = 144.50$

$x = 20.64$

39) Find p and then tell how many degrees each angle is. Angles CBA and ABE are called _____.



39) Angles called vertical.

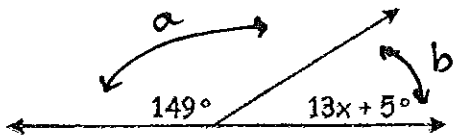
$5p + 28 = 12p$
$-5p \quad\quad -5p$

$\frac{28}{7} = \frac{7}{7}p$

$p = 4$

$5(4) + 28 = 48°$ ∠CBA
$12(4) = 48°$ ∠DBE

40) Find x and then tell how many degrees each angle is. These angles are called _____.



40) Adjacent, but better name is supplementary.

$149 + 13x + 5 = 180$

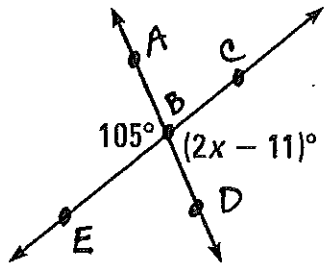
$13x + 154 = 180$
$-154 \quad -154$

$13x = 26$

$x = 2$

$b = 13(2) + 5 = 31°$
$a = 149°$

41) Find x and then tell how many degrees each angle is.



41) $2x - 11 = 105$
$+11 \quad +11$

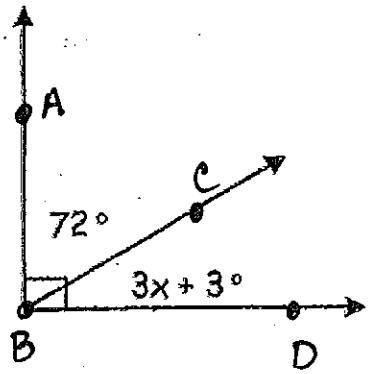
$2x = 116$

$x = 58°$

$\angle ABE = 105°$

$\angle CBD = 2(58) - 11 = 105°$

42) Find x and then tell the measures of each angle. These angles are called _____.



42) Angles called complementary. They are also adjacent.

$72 + 3x + 3 = 90$

$3x + 75 = 90$
$-75 \quad -75$

$3x = 15$

$x = 5$

$\angle CBD = 3(5) + 3 = 18°$

43) Solve the proportion.

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

43) $\frac{x-2}{5}=\frac{x+1}{2}$

$2(x-2)=5(x+1)$

$2x-4=5x+5$

$-2x \quad -2x$

$-4=3x+5$

$-5 \quad -5$

$-9=3x$

$\boxed{x=-3}$

44) Solve the proportion.

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

44) $\frac{2x-1}{x+2}=\frac{3}{4}$

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

$3x+6=8x-4$

$-3x \quad -3x$

$6=5x-4$

$+4 \quad +4$

$\frac{10}{5}=\frac{5x}{5}$

$\boxed{x=2}$