**AGLEBRA I**

**1ST SEMESTER**

**FINAL REVIEW**

**This final review contains many of the concepts that we covered during the trimester. It does not have all of them. You are responsible to review all topics covered.**

1. Write an algebraic expression for the phrase.

 The quotient of 5 times *x* and 8 $\frac{5x}{8}$

2. Simplify the expression. $2\left[18-\left(-4\right)+7\right]$ $2\left[18-\left(-4\right)+7\right]$

 $2\left[18+4+7\right]$

 $2\left[29\right]$

 58

3. Use <, =, or > to compare.    <

4. Evaluate the expression for

$-x+\left(-3y\right)-\left|-2z\right|$ $-\left(-3\right)+\left(-3×2\right)-\left|-2×-1\right|$

 $+3+\left(-6\right)-\left|2\right|$

 $3-6-2$

 $-5$

5. Evaluate the expression for

  $\left(5\right)-2\left(-2\right)-\left(3\right)$

 $5+4-3$

 $6$

**For #’s 6 - 8, simplify the expression.**

6.  42

7. $-\left(6x-5\right)$ $-6x+5$

8.  $12q^{2}$

**CHAPTER 2**

**For #’s 1 – 6, solve and check.**

1.  $25=m+1$

 $24=m$

2.  $3x=-15$

 $x=-5$

3.  $\frac{x}{4}+4=-5$

 $\frac{x}{4}=-9$

 $x=-36$

4.  $\frac{w-9}{2}=6$

 $w-9=12$

 $w=21$

5.  $\frac{3y}{8}-2=4$

 $\frac{3y}{8}=6$

 $3y=48$

 $y=16$

6.  $3x+2=x+1$

 $2x+2=1$

 $2x=-1$

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

7. The length of a rectangle is seven inches less than four times the width. The perimeter of the rectangle is 26 inches. What are the width and length of the rectangle?

$w=w$ $26=2w+2\left(4w-7\right)$ $w=4$

$l=4w-7$ $26=2w+8w-14$ $l=4\left(4\right)-7=16-7=9$

$P=2w+2l$ $26=10w-14$

 $40=10w$

 $4=w$

8. Train A leaves a station traveling at 96 kilometers per hour. Two hours later, Train B leaves the same station traveling in the same direction at 106 kilometers per hour. How long does it take Train B to catch up to Train A?

|  |  |  |  |
| --- | --- | --- | --- |
|  | Rate | Time | Distance |
| Train A | 96 | $$t$$ | $$96t$$ |
|  Train B | 106 | $$t-2$$ | $$106\left(t-2\right)$$ |

Since the trains are going the SAME DIRECTION, set the distances equal to each other.

$$96t=106\left(t-2\right)$$

$$96t=106t-212$$

$$-10t=-212$$

$$t=21.2 hrs$$

The question asked for the time for Train B. According to our table, we found the time for Train A. By substituting the time for Train A into the time for Train B.

$$t-2=21.2-2$$

$$19.2 hrs$$

9. Two travelers were 200 kilometers apart at 2:00 p.m. and were headed toward each other. If they met at 4:30 p.m., and one was traveling 20 kilometers per hour faster than the other, what was the speed of each traveler?

|  |  |  |  |
| --- | --- | --- | --- |
|  | Rate | Time | Distance |
| A | r | $$2.5 hrs$$ | $$2.5r$$ |
| B | $$r+20$$ | $$2.5 hrs$$ | $$2.5(r+20$$ |

This is an OPPOSITE DIRECTION problem. Add the distances to get the total distance.

$$2.5r+2.5\left(r+20\right)=200$$

$$2.5r+2.5r+50=200$$

$$5r+50=200$$

$$5r=150$$

$$r=30$$

The speed (rate) of A was 30. The speed of B was 50

10. Mike and Rene walked to a dock at 3 miles per hour, got on a boat, and traveled to Dillion at 7 miles per hour. If the total distance was 24 miles, and the trip took  hours in all, how far did they go by boat?

|  |  |  |  |
| --- | --- | --- | --- |
|  | Rate | Time | Distance |
| Walk | 3 | $$t$$ | $$3t$$ |
|  Boat | 7 | $$5-t$$ | $$7\left(5-t\right)$$ |

You are given the total time of the trip. The time to boat has to be the total time (5 hours) less the time to walk. Since t is the time to walk, the time to boat is 5 – t.

You know the distance they walked and boated. Add the distances to get the total distance of the trip.

$$3t+7\left(5-t\right)=24$$

$$3t+35-7t=24$$

$$-4t+35=24$$

$$-4t=-11$$

$$t=\frac{11}{4}=2.75 hrs$$

You are asked the DISTANCE they traveled by boat. You know that the time in the boat was 5 – t or 5 – 2.75 = 2.25 hours. Substitute this value into $7\left(5-t\right)=7\left(2.25\right)=15.75 miles$

11. Kathy and Chris drove a total of 353 miles in 9.2 hours. Kathy drove the first part of the trip and averaged 35 miles per hour. Chris drove the remainder of the trip and averaged 45 miles per hour. For what length of the time did Kathy drive?

|  |  |  |  |
| --- | --- | --- | --- |
|  | Rate | Time | Distance |
| Kathy | 35 | $$t$$ | $$35t$$ |
|  Chris | 45 | $$9.2-t$$ | $$45\left(9.2-t\right)$$ |

Similar to the previous problem, add the distances together to get the total distance traveled.

$$35t+45\left(9.2-t\right)=353$$

$$35t+414-45t=353$$

$$-10t+414=353$$

$$-10t=-61$$

$$t=6.1 hrs$$

Since t is the time that Kathy drove, this is the answer to the problem.

**For #’s 12 – 14, solve the absolute value equations.**

12. $\left|x\right|=-8$ The absolute value is by itself on the left side of the equation. Since this is

 equal to a negative number, there is **NO SOLUTION**.

13. $\left|2x+3\right|-5=12$ $\left|2x+3\right|-5=12$

 $\left|2x+3\right|=17$

 $2x+3=17 \& 2x+3=-17$

 $2x=14 2x=-20$

 $x=7 x=-10$

14. $-\left|4a-7\right|-10=-34$ $-\left|4a-7\right|-10=-34$

 $-\left|4a-7\right|=-24$

 $ \left|4a-7\right|=24$

 $4a-7=24 \& 4a-7=-24$

 $4a=31 4a=-17$

 $a=\frac{31}{4} a=\frac{-17}{4}$

**CHAPTER 3**

1. Graph the inequality.  **

1

**For #’s 17 - 20, solve and graph the inequality.**

2.  $y+2>-5$

 $y>-7$

-7

 3.  $\frac{x}{4}\leq -5$

 $x\leq -20$

-20

4.  $6x+4>-20$

 $6x>-24$

 $x>-4$

-4

5.  or  $x+2<-5 or x\geq 4$

 $x<-7$

4

-7

**CHAPTER 4**

**For #’s 1 - 3, find the unit rate.**

1. $60 for 8 hours =  2.  = 

3.  = 

**For #’s 4 – 7, solve the proportion.**

4. 5.

  

6. 7.

 

**For #’s 8 & 9, each pair of figures is similar. Find the length of *x*.**

8. 9.

  9.  

**For #’s 10 – 12, use a proportion to solve.**

10.  is similar to . The length of *AB* is

 10. The length of *BC* is 7. Find the length *XY*

 if the length of *YZ* is 14.

**HINT:** Draw any type of triangle and label ABC. Then draw another similar shape triangle. Label the XYZ in the same order that you labeled the ABC. Then set up your proportion

A

B

C

Y

X

Z

10

7

*x*

14

 

11. The blueprint scale is 1 in.: 12 ft. The width of a building is 48 ft. What is the width of the building

 on the blueprint?

 

12. Angie is using similar triangles to find the height of a tree. A stick that is 5 feet tall casts a shadow that is 4

 feet long. The tree casts a shadow that is 22 feet long. How tall is the tree?

Tree

Stick

22’

5’

4’

 

**Solve.**

13. 25% of what is 28? 14. What percent of 12 is 7?

  

15. 22.5% of what is 42? 16. Pablo has a goal to lose 25 lb. He has lost 16 lb. What

 percent of his goal has he reached? **(16 is what % of 25)**

  

17. Kiko spends 30% of her monthly income on rent. If she pays $810 for rent each month, what is her

 monthly income?

 

**For #’s 18 & 19, the formula for determining simple interest is  where *I* is the interest earned, *p* is the principal (starting) amount, *r* is the interest rate, and *t* is the time. Solve the following.**

18. You invest $1500 for three years. Find the 19. Suppose you invested some money at 8%

 amount of simple interest you earn at an simple interest for five years. If you received

 annual rate of 8.25%. $500 in interest, how much money did you

 invest?

  

 **For #’s 20 – 22, find the percent of change. Round to the nearest whole number if necessary.**

20. 18 to 27 21. $15 to $5.50 22. 290 yards to 261 yards

  

23. In 1977, the average number of households with cable television was 16.6%. In 2000, the average number

 of households with cable television was 68%. Find the percent of change.

 

**For #’s 24 & 25, find the greatest possible error and the percent error for each measurement.**

GPE: ½ of measured unit 

24. 6 cm 🡪 0.5cm 25. 36.85 g 🡪 0.005 g

% Error:  

**CHAPTER 5**

1. Find the domain and range of each relation. (-3, -7), (-1, -3), (0, -1), (2, 3), (4, 7)

**Domain: *x* coordinates in order Range: *y* coordinates in order**

**NO REPEATS**

Domain: {-3, -1, 0, 2, 4} Range: {-7, -3, -1, 3, 7}

**For #’s 2 & 3, evaluate each function rule for x = 3.**

2.  3. 

 

**For #’s 4 & 5, find the range of each function for the given domain.**

4.  5. 

 

 **{1, 4, 7} {0, ½}**

6. Write a function rule for the table of values. 

|  |  |
| --- | --- |
| ***x*** | ***f(x)*** |
| 0 | 3 |
| 2 | 5 |
| 4 | 7 |
| 6 | 9 |

7 a. Write a function rule to determine the 42a. 

 change you would get from a $20 bill

 when purchasing items that cost $1.25

 each.

b. Calculate the change when five of 42b. $13.75

 these items are purchased.

c. Can you purchase 17 of these items 42c. No

 with a $20 bill?