

Intro to Pre-Algebra Final Review

Chapter 1: Integers

Simplify each expression. Show all steps below each problem.

$$1.) \frac{45-18}{9 \div 3} = \frac{27}{3}$$

$$\begin{array}{r} 34515 \\ -18 \\ \hline 27 \end{array}$$

(9)

$$2.) 10[9(2+4) - 6 \cdot 2]$$

$$10(9(6) - 6 \cdot 2)$$

$$10(54 - 12)$$

$$10(42) = \textcircled{420}$$

$$\begin{array}{r} 54 \\ -12 \\ \hline 42 \end{array}$$

Evaluate each expression if $x = 7$, $y = 3$, and $z = 9$. Show all work below each problem.

$$3.) 10 - \frac{xz}{9}$$

$$10 - \frac{(7)(9)}{9}$$

$$10 - \frac{63}{9}$$

$10 - 7 = \textcircled{3}$

$$4.) 2x + (4z - 13) - 5$$

$$2(7) + (4(9) - 13) - 5$$

$$14 + (36 - 13) - 5$$

$$14 + 23 - 5$$

$$37 - 5 = \textcircled{32}$$

$$\begin{array}{r} 36 \\ -13 \\ \hline 23 \end{array}$$

$$\begin{array}{r} 14 \\ +23 \\ \hline 37 \end{array}$$

Solve each equation. Show all work below each problem.

$$5.) \frac{43.4}{6.2} = \frac{6.2m}{6.2}$$

$$m = \textcircled{7}$$

$$\begin{array}{r} 7 \\ 6.2 \overline{)43.4} \\ \underline{-434} \\ 0 \end{array}$$

$$\begin{array}{r} 62 \\ \times 7 \\ \hline 434 \end{array}$$

$$6.) m + 10 = -2$$

$$\begin{array}{r} -10 \\ -10 \end{array}$$

$$m = \textcircled{-12}$$

the graph below each problem.

7.) $5g + 1.8 < 4.3$

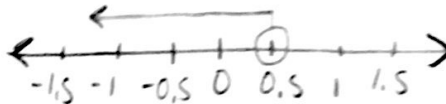
$-1.8 \quad -1.8$

$\frac{5g}{5} < \frac{2.5}{5}$

$g < 0.5$

$$\begin{array}{r} 34.313 \\ -1.8 \\ \hline 2.5 \end{array}$$

$$\begin{array}{r} .5 \\ 5 \overline{) 2.5} \\ -2.5 \\ \hline 0 \end{array}$$



8.) $4(w - 3) \geq 36$

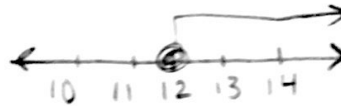
$4w - 12 \geq 36$

$+12 \quad +12$

$\frac{4w}{4} \geq \frac{48}{4}$

$w \geq 12$

$$\begin{array}{r} 12 \\ 4 \overline{) 48} \\ -48 \\ \hline 0 \end{array}$$



Define the variable for each problem and solve algebraically. Make sure to show the formula where needed. Circle all final answers.

9.) A rectangle has a length that is twice its width. Find the area and perimeter of the rectangle if the width is 8 centimeters.

$$\begin{array}{r} 4 \\ 16 \\ \times 8 \\ \hline 128 \end{array}$$

$$\begin{array}{r} 32 \\ +16 \\ \hline 48 \end{array}$$



$A = l \times w$

$A = 16 \times 8$

$A = 128 \text{ cm}^2$

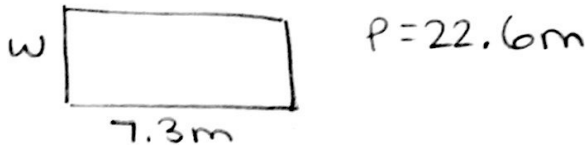
$P = l + l + w + w$

$P = 16 + 16 + 8 + 8$

$P = 32 + 16$

$P = 48 \text{ cm}$

10.) The perimeter of a rectangle is 22.6 meters. If the length of one side is 7.3 meters, what is the width of one side of the rectangle?



$P = l + l + w + w$

$22.6 = 7.3 + 7.3 + w + w$

$22.6 = 14.6 + 2w$

$-14.6 \quad -14.6$

$\frac{8}{2} = \frac{8w}{2}$

$w = 4 \text{ m}$

Chapter 2: Rational Numbers

Write the rational number as a decimal.

11.) $-3\frac{13}{20} = -3.65$

$$\begin{array}{r} 00.65 \\ 20 \overline{) 1300} \\ -1200 \\ \hline 100 \\ -100 \\ \hline 0 \end{array}$$

Write the decimal as a fraction or a mixed number in simplest form.

12.) $3.42 = 3\frac{42}{100} = 3\frac{21}{50}$

Complete the statement using $<$, $>$, or $=$.

13.) $-2\frac{7}{8} < -2\frac{3 \times 2}{4 \times 2}$
 $-2\frac{6}{8}$

14.) $-6.4 > -6.5$

Add or subtract. Write fractions in simplest form.

15.) $-\frac{12}{5} + \left| -\frac{13}{6} \right| + (-3\frac{2}{3})$

$-\frac{12}{5} + \frac{13}{6} + -3\frac{2}{3}$

$-\frac{12}{5} + \frac{13}{6} + -\frac{11}{3}$

$-\frac{7}{30} + -\frac{11}{3} = -\frac{117}{30}$

$-\frac{12 \times 6}{5 \times 6} + \frac{13 \times 5}{6 \times 5}$

$-\frac{72}{30} + \frac{65}{30} = -\frac{7}{30}$

$\frac{12}{72} \times \frac{13}{65}$
 $\frac{6 \times 2}{72} \times \frac{13}{65}$
 $\frac{6 \times 2 \times 13}{72 \times 65}$
 $\frac{156}{4680}$
 $\frac{13}{360}$

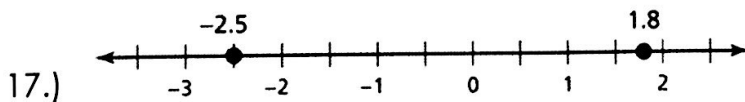
$-\frac{7}{30} + -\frac{11 \times 10}{3 \times 10}$

$-\frac{7}{30} + -\frac{110}{30} = -\frac{117}{30}$

$\begin{array}{r} 4 \\ 5.8 \\ + 10.9 \\ \hline 4.7 \end{array}$

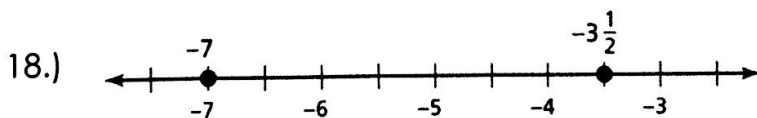
16.) $10.9 + (-15.6) + 2.1$
 $4.7 - 2.1$
 2.6
 $-4.7 + 2.1$
 -2.6

Find the distance between the two numbers on the number line.



$1.8 - -2.5$
 $1.8 + 2.5$
 4.3

$\begin{array}{r} 2.5 \\ + 1.8 \\ \hline 4.3 \end{array}$



$-3\frac{1}{2} - -7$
 $-3\frac{1}{2} + 7$
 $3\frac{1}{2}$

$\begin{array}{r} 7 \\ - 3.5 \\ \hline 3.5 \end{array}$

19.) You buy a bag of dog food for \$12.59 and a bottle of dog shampoo for \$4.75. How much more did the dog food cost than the shampoo?

$\begin{array}{r} 12.59 \\ - 4.75 \\ \hline 7.84 \end{array}$

$\$7.84$

Multiply or divide. Write fractions in simplest form.

20.) $\frac{2}{3} \cdot \left(-2\frac{1}{4}\right) \cdot \left(-1\frac{1}{2}\right)$

$\frac{2}{3} \cdot -\frac{9}{4} \cdot \frac{3}{2}$

$\frac{2}{3} \cdot -\frac{9}{4} \cdot -\frac{3}{2}$
 $= \frac{3}{2} \cdot -\frac{3}{2} = \frac{9}{4}$

21.) $-3.64 \cdot |-5.3| - 1.5^3$
 $-3.64 \cdot 5.3 + 1.5^3$
 $-3.64 \cdot 5.3 + -3.375$
 $-19.292 + -3.375$
 -22.667

$\begin{array}{r} 2 \\ -1.5 \\ \times 1.5 \\ \hline 175 \\ 150 \\ \hline -2.25 \end{array}$

$\begin{array}{r} 1 \quad 2 \\ -2.25 \\ \times \quad 1.5 \\ \hline 1125 \\ + 2250 \\ \hline -3.375 \end{array}$

$\begin{array}{r} 3 \quad 2 \\ 3.64 \\ \times \quad 5.3 \\ \hline 1092 \\ + 18200 \\ \hline 19.292 \end{array}$

$\begin{array}{r} 19.292 \\ + 3.375 \\ \hline 22.667 \end{array}$

Chapter 3: Expressions and Equations

Identify the terms, like terms, constants, and coefficients in the expression.

22.) $x^2 - 3x + 4 + 2x^2 - x - 12$

CO: 1, -3, 2, -1,

T: $x^2, -3x, 4, 2x^2, -x, -12$

con: -4, -12

LT: $x^2 + 2x^2, -3x + -x, 4 + -12$

Find the sum or difference.

23.) $(-2h + 1) + 2(3h - 4)$

$-2h + 1 + 6h - 8$

$4h + -7$

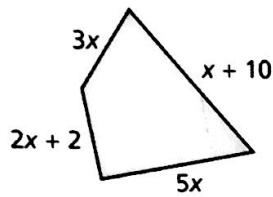
Factor out the coefficient of the variable.

24.) $9x - 36$

$9(x - 4)$

* We did not learn this in class, so don't worry about it! 😊

25.) Write an expression in **simplest form** that represents the **perimeter** of the polygon.



$$P = 3x + (x+10) + 5x + (2x+2)$$

$$P = 3x + x + 10 + 5x + 2x + 2$$

$$11x + 12$$

26.) One page of a petition can hold p signatures. You were able to get $4p + 5$ people to sign the petition. Your friend was able to get $2p - 3$ people to sign the petition. Write an expression that represents the total number of people that you and your friend got to sign the petition.

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

$$4p+5+2p-3$$

$$6p+2$$

Solve the equation. Check your solution.

$$27.) -\frac{1}{3} + 2z = -\frac{5}{6}$$

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

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

$$\frac{2z}{2} = \frac{-\frac{3}{6}}{2}$$

$$z = -\frac{1}{4}$$

$$-\frac{5}{6} + \frac{1 \times 2}{3 \times 2}$$

$$-\frac{5}{6} + \frac{2}{6} = -\frac{3}{6}$$

$$-\frac{3}{6} \div \frac{2}{1}$$

$$-\frac{3}{6} \times \frac{1}{2} = -\frac{3}{12} = -\frac{1}{4}$$

$$28.) -2.9 = 3f + 4.3$$

$$-4.3$$

$$-4.3$$

$$\frac{-7.2}{3} = \frac{3f}{3}$$

$$-2.4 = f$$

$$\begin{array}{r} 4.3 \\ + 2.9 \\ \hline 7.2 \end{array}$$

$$\begin{array}{r} 2.4 \\ 3 \overline{) 7.2} \\ \underline{-6} \\ 1.2 \\ \underline{-1.2} \\ 0 \end{array}$$

Write the word sentence as an equation.

29.) The quotient of 5 plus a number d and negative 2 is 14.

$$\frac{(5+d)}{-2} = 14$$

Write an equation. Then solve.

30.) The temperature of dry ice is -109.3 degrees. This is 184.9 degrees less than the outside temperature. What is the outside temperature?

$$\begin{array}{r} -109.3 = x - 184.9 \\ +184.9 \quad +184.9 \end{array}$$

$$\begin{array}{r} 714 \\ 184.9 \\ -109.3 \\ \hline 75.6 \end{array}$$

$$75.6 = x \quad \text{75.6}^\circ$$

31.) A pack of cardinal flower seeds costs \$4, and a pack of petunia flower seeds costs \$2.50. You buy the same number of packs of each type of flower and spend \$39. How many packs of each do you buy?

$$4x + 2.50x = 39$$

$$\begin{array}{r} 6.5 \overline{)39.0} \\ -39.0 \\ \hline 0 \end{array}$$

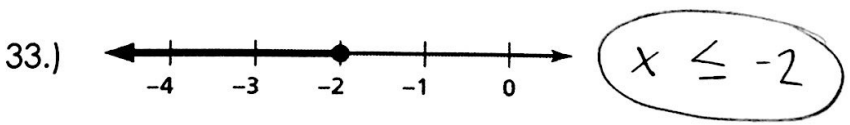
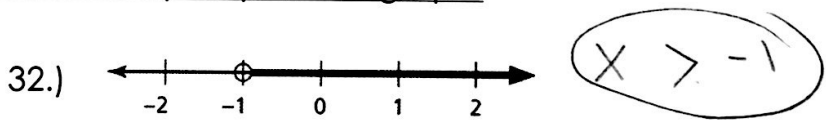
$$\begin{array}{r} 2 \quad 3 \\ \times 65 \quad \times 65 \\ \hline 325 \quad 390 \end{array}$$

$$\begin{array}{r} 6.50x = 39 \\ \hline 6.50 \quad 6.50 \\ x = 6 \end{array}$$

6 packs

Chapter 4: Inequalities

Write an inequality for the graph.



Write the word sentence as an inequality.

34.) A number x divided by -1 is at least -4 .

$$\frac{x}{-1} \geq -4$$

35.) A number y is no more than -8 .

$$y \leq -8$$

Tell whether the given value is a solution of the inequality.

36.) $j + 1 > 10$; $j = 9$

$$9 + 1 > 10$$

$$10 > 10$$

NO

37.) A subway ride for a student costs $\$1.25$. A monthly pass costs $\$35$. (write both answers below)

a.) Write an inequality that represents the number of times you must ride the subway for the monthly pass to be a better deal.

$$1.25x > 35$$

b.) You ride the subway about 45 times per month. Should you buy the monthly pass? Explain

Yes b/c you will spend $\$56.25$ if you don't buy a monthly pass. $\$35$ is cheaper.

$$\begin{array}{r} 1.25 \\ \times 45 \\ \hline 625 \\ + 5000 \\ \hline 56.25 \end{array}$$

38.) $9y - 4y + 4 \geq 36 - 12$

$$\begin{array}{r} 5y + 4 \geq 24 \\ -4 \quad -4 \\ \hline 5y \geq 20 \\ \div 5 \quad \div 5 \\ \hline y \geq 4 \end{array}$$

$$y \geq 4$$

$$39.) 9 < -\frac{w}{4} + 8$$

$$-8 \quad -8$$

$$1 < -\frac{w}{4}$$

$x - 4$

$$-4 > w$$

★ Remember: Multiply or Divide by a negative makes the inequality symbol flip!

Solve the inequality. Graph the solution.

$$40.) 3(x + 4) \geq 12$$

$$3x + 12 \geq 12$$

$$\begin{array}{r} 3x + 12 \geq 12 \\ -12 \quad -12 \end{array}$$

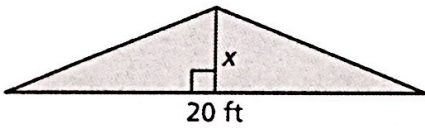
$$\frac{3x}{3} \geq \frac{0}{3}$$

$$x \geq 0$$



Write and solve an inequality that represents the value of x.

41.) The area is no more than 40 feet.



$$a = \frac{bh}{2}$$

$$\frac{20 \cdot x}{2} \leq 40$$

$$\frac{20x}{2} \leq 40 \times 2$$

$$\frac{20x}{20} \leq \frac{80}{20}$$

$$x \leq 4$$

Chapter 5: Ratios and Proportions

Read each problem carefully and make sure to solve each problem algebraically to receive full credit. Show all work below each problem.

42.) A scientist is mixing a chemical solution for an experiment. The solution contains $\frac{3}{8}$ ounce of a chemical and $\frac{1}{6}$ ounce saline solution. What is the unit rate of chemical to saline solution?

$$\frac{3}{8} \div \frac{1}{6}$$

$$\frac{3}{8} \times \frac{6}{1} = \frac{9}{4}$$

$$\frac{9}{4} \text{ oz chemical/saline}$$

43.) A store sells a $1\frac{1}{4}$ pound package of turkey for \$9. What is the unit price of the turkey in the package?

$$\$9 \div 1\frac{1}{4}$$

$$9 \div \frac{5}{4}$$

$$\frac{9}{1} \times \frac{4}{5} = \frac{36}{5}$$

$$5 \overline{) 36.0}$$

$$\begin{array}{r} 7.20 \\ 5 \overline{) 36.0} \\ \underline{-35} \\ 10 \\ \underline{-10} \\ 0 \end{array}$$

$$\$7.20/\text{lb}$$

44.) Given the table below, find the constant of proportionality.

| | | | | |
|---|-----|-----|-----|-----|
| X | 2 | 4 | 7 | 9 |
| Y | 0.4 | 0.8 | 1.4 | 1.8 |

$$k = \frac{y}{x}$$

$$k = \frac{0.4}{2}$$

$$k = 0.2$$

$$\begin{array}{r} 0.2 \\ 2 \overline{)0.4} \\ \underline{-4} \\ 0 \end{array}$$

45.) A recipe that makes 8 servings requires $3\frac{1}{2}$ cups of milk. Write and solve a proportion equation that can be used to find the number of servings, x , that can be made using 14 cups of milk, based on the recipe.

$$\begin{array}{r} 3 \\ \times 14 \\ \hline 112 \end{array}$$

$$\frac{8 \text{ serv}}{3\frac{1}{2} \text{ milk}} = \frac{x}{14 \text{ milk}}$$

$$\frac{8}{3\frac{1}{2}} = \frac{x}{14}$$

$$\frac{8}{\frac{7}{2}} = \frac{x}{14}$$

$$\frac{8 \times 2}{7} = \frac{x}{14}$$

$$\frac{16}{7} = \frac{x}{14}$$

$$16 \times 2 = 7x$$

$$32 = 7x$$

$$x = \frac{32}{7}$$

$$\frac{3\frac{1}{2}}{8} x = \frac{14}{8}$$

$$x = \frac{224}{7}$$

$$x = 32 \text{ servings}$$

$$112 \div 3\frac{1}{2}$$

$$\frac{112}{1} \div \frac{7}{2}$$

$$\frac{112}{1} \times \frac{2}{7} = \frac{224}{7}$$

46.) The table below shows the amounts of cooked rice that can be made using different amounts of dry rice. Based on the information in the table, how many cups of cooked rice can be made from 1 cup of dry rice?

$$\begin{array}{r} 112 \\ \times 2 \\ \hline 224 \end{array}$$

| | | | | |
|------------------------------|----------------|---------------|----------------|----------------|
| Amount of Dry Rice (cups) | $\frac{2}{3}$ | $\frac{3}{4}$ | $1\frac{1}{3}$ | $1\frac{3}{4}$ |
| Amount of Cooked Rice (cups) | $2\frac{2}{3}$ | 3 | $5\frac{1}{3}$ | 7 |

$$\frac{\text{cooked rice}}{\text{dry rice}} = \frac{2\frac{2}{3}}{\frac{2}{3}} = \frac{x}{1}$$

$$\frac{2\frac{2}{3}}{\frac{2}{3}} = \frac{x}{1}$$

$$\frac{8}{3} x = \frac{2\frac{2}{3}}{\frac{2}{3}}$$

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

$$x = \frac{8}{2}$$

$$x = 4 \text{ cups}$$

$$2\frac{2}{3} \div \frac{2}{3}$$

$$\frac{8}{3} \div \frac{2}{3}$$

$$4 \frac{8}{3} \times \frac{3}{2} = 4$$

Chapter 6: Percents

Write the percent as a decimal.

47.) 66.7% → 0.667

DP

48.) Thursday afternoon between 4:00 and 5:00 you spend $\frac{1}{4}$ of the hour reading email, 0.4 hour doing homework, and 35% of the hour doing chores. Write the tasks in order from least amount of time to greatest.

0.25, 0.35, 0.4
 reading email, doing chores, doing homework

$$\begin{array}{r} 0.25 \\ 4 \overline{) 1.00} \\ \underline{- 80} \\ 20 \end{array}$$

Use the table that shows the results of a class poll for #49.

| Question | Yes | No |
|-------------------------------|-----------------|-----------------|
| Do you walk to school? | 18% | 82% |
| Is there a pet in your home? | $\frac{14}{25}$ | $\frac{11}{25}$ |
| Do you play on a sports team? | 0.42 | 0.58 |

49.) $\frac{11}{50}$ of the students live within $\frac{1}{2}$ mile of the school. Is this greater than or less than the portion of students who walk to school?

$$\frac{18}{100} \quad \frac{11 \times 2}{50 \times 2} = \frac{22}{100}$$

Students who walk to school is greater than the students who live within $\frac{1}{2}$ mile of the school.

Write and solve a proportion to answer the question.

50.) 35% of what number is 21?

$$\frac{\text{is}}{\text{of}} = \frac{x}{100}$$

$$\frac{21}{x} = \frac{35}{100}$$

$$\frac{35x}{35} = \frac{2100}{35}$$

$$\begin{array}{r} 60 \\ 35 \overline{) 2100} \\ \underline{- 210} \\ 00 \end{array}$$

$$\begin{array}{r} 2 \\ 35 \\ \times 4 \\ \hline 140 \end{array} \quad \begin{array}{r} 3 \\ 35 \\ \times 6 \\ \hline 210 \end{array}$$

$$x = 60$$

Write and solve an equation to answer the question.

51.) 60 cars to 24 cars What is the percent of change?

$$\begin{array}{r} 5 \\ 60 \times 6 \\ \underline{- 24} \\ 36 \end{array}$$

$$\frac{\text{change}}{\text{orig}} = \frac{\text{percent}}{100}$$

$$\frac{36}{60} = \frac{x}{100}$$

$$\frac{60x}{60} = \frac{3600}{60}$$

$$x = 60$$

$$60\%$$

$$\begin{array}{r} 60 \\ 6 \overline{) 360} \\ \underline{- 36} \\ 00 \end{array}$$

Use the percent of change to find the new amount.

52.) 820 brushes decreased by 25%

$$\begin{array}{r} 820 \\ \times 25 \\ \hline 4100 \\ + 16400 \\ \hline 20500 \end{array}$$

$$\frac{x}{820} = \frac{25}{100} \quad x = 205 \text{ brushes}$$

$$100x = 20500 \quad \frac{20500}{100} = 205$$

$$\begin{array}{r} 820 \\ - 205 \\ \hline 615 \end{array}$$

615 brushes

Find the original price, discount, sale price, or selling price.

53.) Original price: \$125

Discount: ?

Sale price: \$81.25

$$\text{Sale} = \text{orig} - \text{orig}(\text{discount})$$

$$\begin{array}{r} 125.00 \\ - 81.25 \\ \hline 43.75 \end{array}$$

$$81.25 = 125 - 125x$$

$$-125 \quad -125$$

$$-43.75 = -125x$$

$$\frac{-43.75}{-125} = \frac{-125x}{-125}$$

$$x = .35 \quad \mathbf{35\%}$$

$$\begin{array}{r} 125 \\ \times .35 \\ \hline 375 \\ + 3750 \\ \hline 43.75 \end{array}$$

$$\begin{array}{r} 125 \\ \times 3 \\ \hline 375 \\ + 1250 \\ \hline 3750 \\ + 12500 \\ \hline 37500 \end{array}$$

54.) Cost to store: \$32

Markup: 16%

Selling price: ?

$$\text{Selling price} = \text{cost} + \text{cost}(\text{markup})$$

$$\begin{array}{r} 32.00 \\ + 5.12 \\ \hline 37.12 \end{array}$$

\$37.12

$$X = 32 + 32(.16)$$

$$X = 32 + 5.12$$

$$X = 37.12$$

$$\begin{array}{r} 32 \\ \times .16 \\ \hline 192 \\ + 320 \\ \hline 5.12 \end{array}$$

An account earns annual simple interest. Find the interest earned, principal, interest rate, or time. $I = PRT$

55.) Interest earned: \$39.60

Principal: ?

Interest rate: 11%

Time: 6 months

$$39.60 = P \cdot .11 \cdot \frac{6}{12}$$

$$39.60 = P \times .11 \times .5$$

$$\frac{39.60}{.055} = \frac{.055P}{.055}$$

$$P = 720$$

\$720

$$\begin{array}{r} .11 \\ \times .5 \\ \hline .055 \end{array}$$

$$\begin{array}{r} .055 \overline{) 39.600} \\ \underline{720} \\ 39600 \\ \underline{3850} \\ 1100 \\ \underline{1100} \\ 0 \end{array}$$

$$\begin{array}{r} 720 \\ \times 55 \\ \hline 3600 \\ + 33600 \\ \hline 39600 \end{array}$$

An account earns annual simple interest. Find the balance of the account.

56.) \$250 at 4% for 1 year $I = PRT$

$$I = 250 \times .04 \times 1$$

$$I = \$10$$

$$B = P + I$$

$$B = 250 + 10$$

$$B = 260$$

\$260

$$\begin{array}{r} 250 \\ \times .04 \\ \hline 1000 \\ + 0000 \\ \hline 10.00 \end{array}$$

57.) The price of your favorite brand of jeans was \$35 last month. This month the price is \$42. What is the percent of change from last month to this month?

$$\frac{\text{change}}{\text{orig}} = \frac{\text{percent}}{100}$$

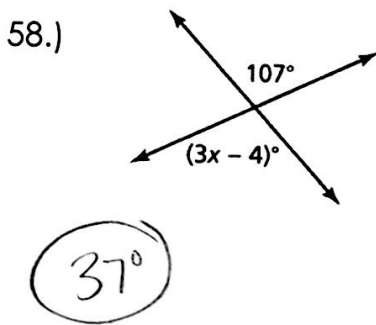
$$\frac{7}{35} = \frac{x}{100}$$

$$35x = 700 \quad x = 20$$

20%

Chapter 7: Constructions and Scale Drawings

Tell whether the angles are *adjacent* or *vertical*. Then find the value of x.



vertical

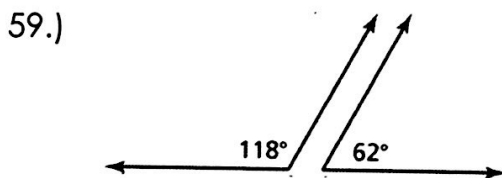
$$107 = 3x - 4$$

$$+4 \quad +4$$

$$\frac{111}{3} = \frac{3x}{3}$$

$$37 = x$$

Tell whether the angles are *complementary*, *supplementary*, or *neither*.



$$\frac{118}{+ 62}$$

$$\frac{180}{180}$$

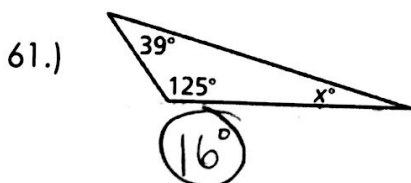
supplementary

60.) The measures of two complementary angles have a ratio of 2 : 7. What is the measure of the smaller angle?

$$\frac{2}{9} = \frac{x}{90}$$

x = 20°

Find the value of x. Then classify the triangle (according to sides and angles).



$$180 = 39 + 125 + x$$

$$180 = 164 + x$$

$$-164 \quad -164$$

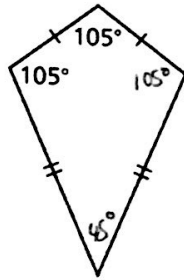
$$16 = x$$

scalene obtuse

Classify the quadrilateral. Find the missing angle measure(s).

62.)

$$\begin{array}{r} 105 \\ \times 3 \\ \hline 315 \end{array}$$



Kite
105°, 45°

$$\begin{array}{r} 360 = 105 + 105 + 105 + x \\ 360 = 315 + x \\ -315 \quad -315 \\ \hline 45 = x \end{array}$$

63.) Using a protractor, draw a rhombus with two 60° angles.

Find the missing dimension. Use the scale factor 5 : 8.

64.) Model width: ?

Actual width: 20 ft

12.5 ft

$$\frac{x}{20} = \frac{5}{8}$$

$$\frac{100}{8} = \frac{x}{8}$$

$$x = 12.5$$

$$\begin{array}{r} 12.5 \\ 8 \overline{)100.0} \\ -8 \downarrow \\ \hline 20 \\ -16 \downarrow \\ \hline 40 \\ -40 \\ \hline 0 \end{array}$$

65.) A scale drawing of a painting is 12 inches long and 8 inches tall. The actual painting is 2 feet tall.

a. What is the scale of the drawing?

scale 12 in

Actual 2 ft
x

$$\frac{8 \text{ in}}{12 \text{ in}} = \frac{2}{x}$$

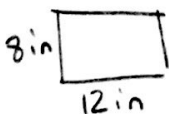
$$\frac{24}{8} = \frac{x}{8}$$

$$x = 3 \text{ ft}$$

scale:

$$\frac{8 \text{ in}}{2 \text{ ft}} = \frac{4 \text{ in}}{1 \text{ ft}}$$

b. Find the perimeter and area of the painting in the scale drawing.



$$P = 2l + 2w$$

$$P = 2(12) + 2(8)$$

$$P = 24 + 16$$

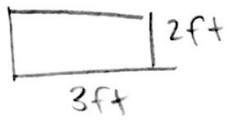
$$P = 40 \text{ in}$$

$$A = l \times w$$

$$A = 12 \times 8$$

$$A = 96 \text{ in}^2$$

c. Find the actual perimeter and area of the painting.



$$P = 2l + 2w$$

$$P = 2(3) + 2(2)$$

$$P = 6 + 4$$

$$P = 10ft$$

$$A = l \times w$$

$$A = 3 \times 2$$

$$A = 6ft^2$$

Chapter 8: Circles and Area

Write and solve an equation to find the missing radius of the circle.

66.) Diameter = 24 in.

67.) Circumference = 314 m

$$r = \frac{d}{2}$$

$$r = \frac{24}{2}$$

$$r = 12in$$

$$C = 2\pi r$$

$$314 = 2 \times 3.14 \times r$$

$$\frac{314}{6.28} = \frac{6.28r}{6.28}$$

$$50m = r$$

Find the circumference and area of the circle. Use 3.14 or $\frac{22}{7}$ for π .

68.) $r = 10ft$

$$C = 2\pi r$$

$$C = 2 \times 3.14 \times 10$$

$$C = 6.28 \times 10$$

$$C = 62.8ft$$

$$A = \pi r^2$$

$$A = 3.14 \times 10^2$$

$$A = 3.14 \times (10 \cdot 10)$$

$$A = 3.14 \times 100$$

$$A = 314ft^2$$

69.) The radius of a circle is 18 meters. What is the diameter?

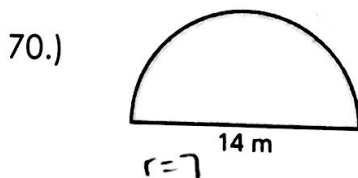
$$\begin{array}{r} 18 \\ \times 2 \\ \hline 36 \end{array}$$

$$d = 2r$$

$$d = 18 \times 2$$

$$d = 36m$$

Find the perimeter and area of the semicircle.



$$P = 35.98m$$

$$P = \frac{2\pi r}{2} + d$$

$$P = \frac{2 \times 3.14 \times 7}{2} + 14$$

$$P = \frac{6.28 \times 7}{2} + 14$$

$$P = \frac{43.96}{2} + 14$$

$$P = 21.98 + 14$$

$$A = \frac{\pi r^2}{2}$$

$$A = \frac{3.14 \times 7^2}{2}$$

$$A = \frac{3.14 \times 49}{2}$$

$$A = \frac{153.76}{2}$$

$$A = 76.88m^2$$

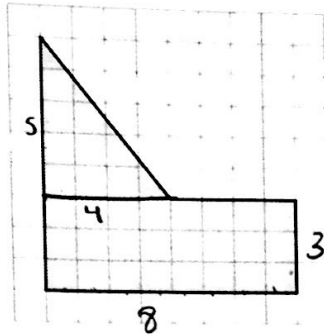
$$\begin{array}{r} 3.14 \\ \times 49 \\ \hline 2826 \\ + 12560 \\ \hline 15376 \end{array}$$

$$\begin{array}{r} 76.88 \\ 2 \overline{) 153.76} \\ \underline{-147} \\ 60 \\ \underline{-56} \\ 40 \\ \underline{-38} \\ 20 \\ \underline{-20} \\ 0 \end{array}$$

$$\begin{array}{r} 15 \\ 6.28 \\ \times 7 \\ \hline 43.96 \\ 21.98 \\ \hline 43.96 \\ \underline{-46} \\ 03 \\ \underline{-2} \\ 19 \\ \underline{-17} \\ 16 \\ \underline{-16} \\ 0 \end{array}$$

Find the area of each figure.

71.)



$$\begin{aligned} \square A &= l \times w \\ A &= 8 \times 3 \\ A &= 24 \text{ units}^2 \end{aligned}$$

$$\begin{aligned} \triangle A &= \frac{bh}{2} \\ A &= \frac{4 \times 5}{2} \\ A &= \frac{20}{2} \\ A &= 10 \text{ units}^2 \end{aligned}$$

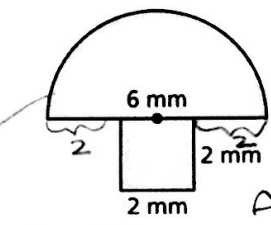
$$\begin{array}{r} 24 \\ + 10 \\ \hline 34 \text{ units}^2 \end{array}$$

$$\begin{array}{r} 14.13 \\ 2 \overline{)28.26} \\ \underline{28} \\ 26 \\ \underline{26} \\ 0 \end{array}$$

$$\begin{array}{r} 6.28 \\ \times 3 \\ \hline 18.78 \end{array}$$

$$\begin{array}{r} 7.39 \\ 2 \overline{)14.78} \\ \underline{14} \\ 78 \\ \underline{78} \\ 0 \end{array}$$

$$\begin{aligned} P &= \frac{2\pi r}{2} + 4 \\ P &= \frac{2 \times 3.14 \times 3}{2} + 4 \\ P &= \frac{6.28 \times 3}{2} + 4 \\ P &= \frac{18.78}{2} + 4 \\ P &= 9.39 + 4 \\ P &= 13.39 \end{aligned}$$

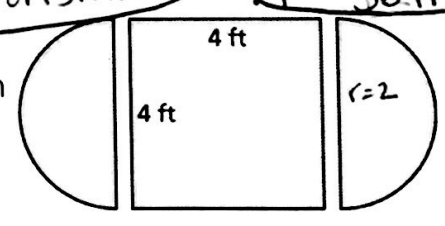


$$\begin{aligned} \square P &= 2(l) + 2(w) \\ P &= 2(2) + 2 \\ P &= 4 + 2 \\ P &= 6 \text{ mm} \end{aligned}$$

$$\begin{aligned} \triangle A &= \frac{\pi r^2}{2} \\ A &= \frac{3.14 \times 3^2}{2} \\ A &= \frac{3.14 \times 9}{2} \\ A &= \frac{28.26}{2} \\ A &= 14.13 \text{ mm}^2 \end{aligned}$$

$$\begin{array}{r} 13.39 \\ + 6.00 \\ \hline 19.39 \end{array}$$

74.) A square table 4 feet on each side has two drop leaves, each a semicircle 4 feet in diameter.



Find the area and perimeter of the table with and without the drop leaves.

WITH

$$\begin{aligned} \square A &= l \times w \\ A &= 3.14 \times 2^2 \\ A &= 3.14 \times 4 \\ A &= 12.56 \text{ ft}^2 \end{aligned}$$

$$\begin{aligned} \square A &= l \times w \\ A &= 4 \times 4 \\ A &= 16 \text{ ft}^2 \end{aligned}$$

$$\begin{array}{r} 12.56 \\ + 16.00 \\ \hline 28.56 \end{array}$$

$A = 28.56 \text{ ft}^2$

$$\begin{aligned} \square P &= 4 + 4 \\ P &= 8 \text{ ft} \end{aligned}$$

$$\begin{aligned} \square P &= 2l + 2w \\ P &= 2 \times 3.14 \times 2 \\ P &= 6.28 \times 2 \\ P &= 12.56 \text{ ft} \end{aligned}$$

$$\begin{array}{r} 12.56 \\ + 8.00 \\ \hline 20.56 \end{array}$$

$P = 20.56 \text{ ft}$

WITHOUT

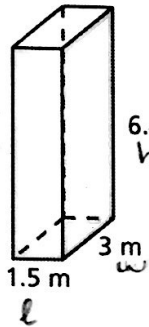
$$\begin{aligned} \square A &= l \times w \\ A &= 4 \times 4 \\ A &= 16 \text{ ft}^2 \end{aligned}$$

$$\begin{aligned} P &= 2l + 2w \\ P &= 2(4) + 2(4) \\ P &= 8 + 8 \\ P &= 16 \text{ ft} \end{aligned}$$

Chapter 9: Surface Area and Volume

Find the surface area and volume of the prism.

75.)



$$SA = 2lh + 2lw + 2hw \quad (76.)$$

$$SA = 2(1.5 \times 6.4) + 2(1.5 \times 3) + 2(6.4 \times 3)$$

$$SA = 2(9.6) + 2(4.5) + 2(19.2)$$

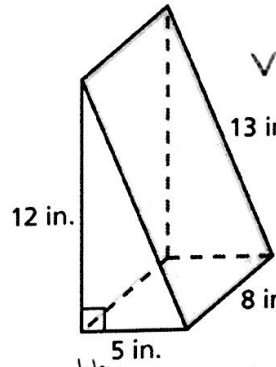
$$SA = 19.2 + 9 + 38.4$$

$$SA = 66.6 \text{ m}^2$$

$$V = L \times W \times h$$

$$V = 1.5 \times 3 \times 6.4$$

$$V = 28.8 \text{ m}^3$$



$$V = Bh$$

$$V = \frac{bh}{2} \cdot h$$

$$V = \frac{12 \cdot 5}{2} \cdot 8$$

$$V = \frac{60}{2} \cdot 8$$

$$V = 240 \text{ in}^3$$

$$SA = 2\left(\frac{bh}{2}\right) + lw + lw + lw$$

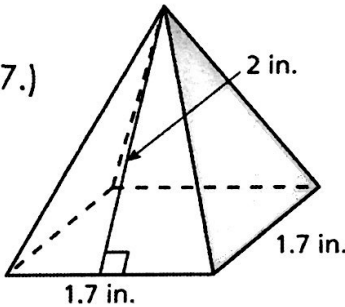
$$SA = 2\left(\frac{12 \times 5}{2}\right) + 8 \times 13 + 5 \times 8 + 8 \times 12$$

$$SA = 60 + 104 + 40 + 96$$

$$SA = 300 \text{ in}^2$$

Find the surface area of the regular pyramid. Round your answer to the nearest tenth.

77.)



$$SA = 4 \cdot \frac{bh}{2} + lw$$

$$SA = 4 \cdot \frac{1.7 \times 2}{2} + (1.7 \times 1.7)$$

$$SA = 2 \cdot 3.4 + 2.89$$

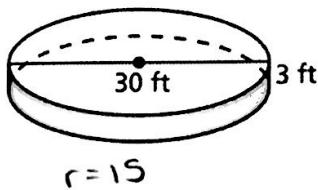
$$SA = 6.8 + 2.89$$

$$SA = 9.69 \text{ in}^2$$

$$9.7 \text{ in}^2$$

Find the surface area of the cylinder. Round your answer to the nearest tenth.

78.)



$$A = 2\pi rh + 2\pi r^2$$

$$A = 2 \times 3.14 \times 15 \times 3 + 2 \times 3.14 \times 15^2$$

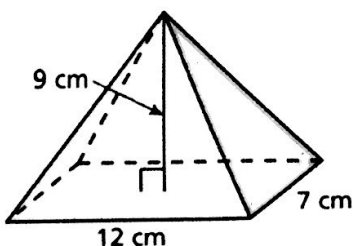
$$A = 282.6 + 2 \times 3.14 \times 225$$

$$A = 282.6 + 1413$$

$$A = 1,695.6 \text{ ft}^2$$

Find the volume of the regular pyramid.

79.)



$$V = \frac{1}{3} Bh$$

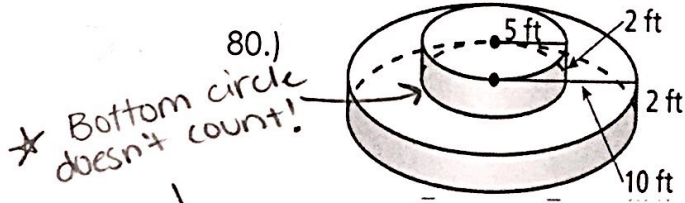
$$V = \frac{1}{3} (l \cdot w) \cdot h$$

$$V = \frac{1}{3} (12 \times 7) \times 9$$

$$V = \frac{1}{3} \times 756$$

$$V = 252 \text{ cm}^3$$

Find the surface area of the composite solid.



80.)

* Bottom circle doesn't count!

TOP

$$SA = 2\pi rh + \pi r^2$$

$$SA = 2 \times 3.14 \times 5 \times 2 + 3.14 \times 5^2$$

$$SA = 62.8 + 3.14 \times 25$$

$$SA = 62.8 + 78.5$$

$$SA = 141.3 \text{ ft}^2$$

BOTTOM

$$SA = 2\pi rh + 2\pi r^2$$

$$SA = 2 \times 3.14 \times 10 \times 2 + 2 \times 3.14 \times 10^2$$

$$SA = 125.6 + 2 \times 3.14 \times 100$$

$$SA = 125.6 + 628$$

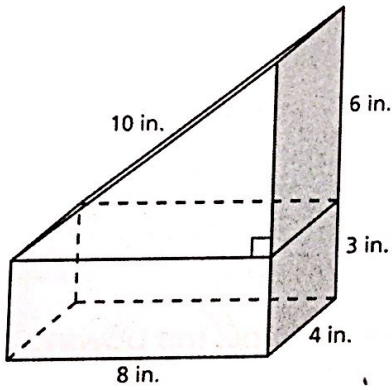
$$SA = 753.6 \text{ ft}^2 - \pi r^2$$

$$753.6 - (3.14 \times 5^2)$$

$$753.6 - 78.5 = 675.1$$

Find the volume of the composite solid below.

81.)



TOP

$$v = Bh$$

$$v = \frac{bh}{2} \cdot h$$

$$v = \frac{8 \cdot 6}{2} \cdot 4$$

$$v = 84 \text{ in}^3$$

$$\begin{array}{r} 42 \\ \times 2 \\ \hline 84 \end{array}$$

$$816.4 \text{ ft}^2 + 675.1 = 1491.5 \text{ ft}^2$$

BOTTOM

$$v = lwh$$

$$v = 8 \times 4 \times 3$$

$$v = 96 \text{ in}^3$$

$$\begin{array}{r} 96 \\ + 84 \\ \hline 180 \end{array}$$

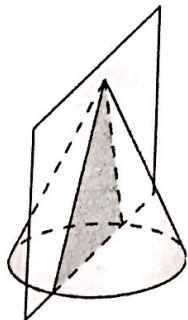
180 in³

82.) What happens to the volume of a rectangular prism when the length and width are doubled and the height is tripled?

The volume is multiplied by 12.

Identify the intersection of the plane and the solid.

83.)



triangle

Chapter 10: Probability and Statistics

84.) A bag contains 8 red marbles, 3 green marbles, 2 white marbles and 1 yellow marble. What is the probability of selecting a white marble?

a. $\frac{1}{7}$

b. $\frac{1}{14}$

c. 2

d. $\frac{1}{6}$

$$\frac{2}{14} = \frac{1}{7}$$

85.) A die is rolled 5 times and a "2" is rolled each time. What is the experimental probability for rolling a 3?

a. $\frac{2}{5}$

b. $\frac{3}{5}$

c. 0

d. 1

$$\frac{0}{5} = 0$$

86.) Mark bowls a strike 32% of the time. If he rolls the bowling ball twenty times, how many strikes should he expect to make?

a. 32

b. 20

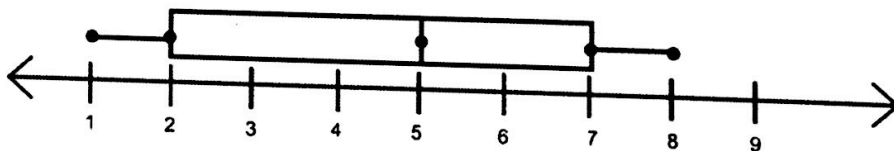
c. 6

d. 5

$$\frac{x}{20} = \frac{32}{100}$$

$$\frac{100x}{100} = \frac{640}{100}$$

$$x = 6.4$$



87.) The party registration of the voters in Jonesville is shown in the table below.

| Registered Voters in Jonesville | |
|---------------------------------|-----------------------------|
| Party Registration | Number of Voters Registered |
| Democrat | 6,000 |
| Republican | 5,300 |
| Independent | 3,700 |

$$\begin{array}{r} 6,000 \\ + 5,300 \\ \hline 3,700 \\ \hline 15,000 \end{array}$$

$$\begin{array}{r} 5,300 \\ + 3,700 \\ \hline 9,000 \end{array}$$

If one of the registered Jonesville voters is selected at random, what is the probability that the person selected is **not a Democrat**?

a. 0.333

b. 0.400

c. 0.600

d. 0.667

$$\frac{9,000}{15,000}$$

$$\frac{9}{15} = \frac{3}{5}$$

$$\begin{array}{r} 0.6 \\ 5 \overline{)30} \\ \underline{-30} \\ 0 \end{array}$$

88.) Peter wants to compare the data he collected about the varsity and junior varsity basketball teams. He recorded the number of points each team earned at every home and away game. Use the following dot plot to answer the questions below.

Points Earned per Game – Varsity Team

Handwritten calculations for absolute deviations:

$$26.25 - 20 = 6.25$$

$$26.25 - 22 = 4.25$$

$$26.25 - 23 = 3.25 \times 3 = 9.75$$

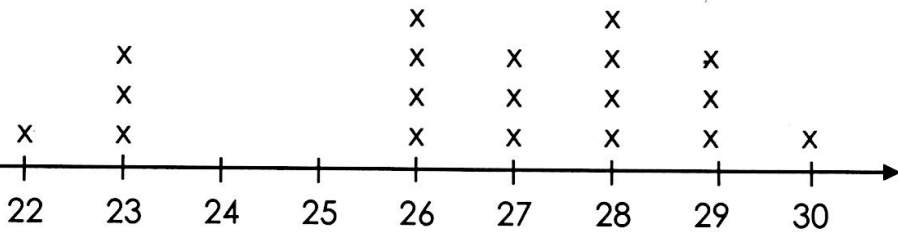
$$26.25 - 26 = 0.25 \times 4 = 1$$

$$26.25 - 27 = -0.75 \times 3 = -2.25$$

$$26.25 - 28 = -1.75 \times 4 = -7$$

$$26.25 - 29 = -2.75 \times 3 = -8.25$$

$$26.25 - 30 = -3.75$$



a. What is the **mean** number of points earned per game for the Varsity Team?

$$20 + 22 + (23 \times 3) + (26 \times 4) + (27 \times 3) + (28 \times 4) + (29 \times 1) + 30$$

$$20 + 22 + 69 + 104 + 81 + 112 + 29 + 30$$

$$525 \div 20 = 26.25$$

b. What is the **mean absolute deviation** of the Varsity Team?

$$6.25 + 4.25 + 9.75 + 1 + 2.25 + 7 + 8.25 + 3.75$$

$$42.5 \div 20 = 2.125$$

89) A survey of 500 randomly selected people who commute to Manhattan for work showed that 187 of them used public transportation. An estimated 108,000 people commute to Manhattan every workday.

How many commuters use public transportation?

$$\frac{187}{500} = \frac{x}{108,000}$$

$$\frac{500x}{500} = \frac{20,196,000}{500}$$

$$x = 40,392 \text{ people}$$