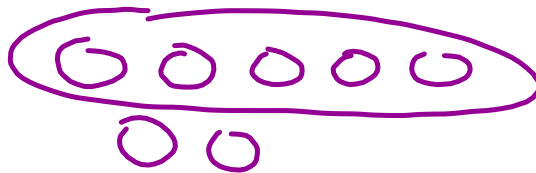


Finals Review 12/18/17

Module 1: Fraction Operations and Real Numbers

$$1. \frac{4}{5} + \frac{6}{10} = \frac{8}{10} + \frac{6}{10}$$

$$= \frac{14}{10} = \frac{7}{5} = 1\frac{2}{5}$$



$$2. \frac{3}{7} \cdot \frac{5}{8} =$$

$$\frac{15}{56}$$

$$3. \frac{3}{4} \div \frac{1}{4} =$$

$$4. \frac{7}{9} - \frac{1}{5} = \frac{35}{45} - \frac{9}{45}$$

$$\frac{3}{4} \times \frac{4}{1} = \frac{12}{4} = 3$$

$$\frac{35}{45} - \frac{9}{45} = \frac{26}{45}$$

5. Ali bought $6\frac{1}{4}$ yards of material. She used $2\frac{2}{5}$ yards to make a dress. How much material does she have left?

$$6\frac{1}{4} - 2\frac{2}{5}$$

$$\frac{25}{4} - \frac{12}{5}$$

$$\frac{77}{20} = 3\frac{17}{20}$$

$$20 \overline{) 77} \\ \underline{-60} \\ 17$$

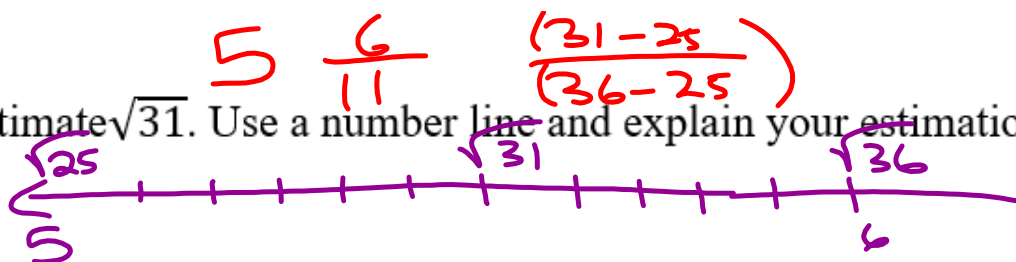
6. Daysha has 60 movies. Of^x those movies, $\frac{3}{5}$ are comedies.
How many of Daysha's movies are comedies?

$$\frac{3}{5} \times \frac{60}{1} = \frac{180}{5}$$
$$= 36 \text{ movies}$$

7. Convert the following fractions, decimals, and percent.

Fraction	Decimal	Percent
$\frac{3}{8}$	$0.\overline{375}$	37.5%
$\frac{3}{100}$	0.03	3%
$\frac{2}{10} = \frac{1}{5}$	0.2	20%
$\frac{145}{1000} = \frac{29}{200}$	0.145	14.5%
$\frac{4}{5}$	0.8	80%

8. Estimate $\sqrt{31}$. Use a number line and explain your estimation.



9. Estimate $\sqrt{52}$. Use a number line and explain your estimation.

$$\begin{array}{ccc}
 \sqrt{49} & \sqrt{52} & \sqrt{64} \\
 \downarrow & & \downarrow \\
 7 & & 8 \\
 & \begin{array}{r} 3 \\ \hline 15 \end{array} & \begin{array}{r} 52-49 \\ 64-49 \end{array} \\
 = \boxed{7\frac{1}{5}} & &
 \end{array}$$

Number	Rational or Irrational (circle one)	Explain how you know the number is rational or irrational.
10) $\frac{1}{9}$	<input checked="" type="radio"/> Rational Irrational	it is written as a fraction
11.) π	Rational <input checked="" type="radio"/> Irrational	Non-repeating decimal.
12.) $0.\overline{45}$	<input checked="" type="radio"/> Rational Irrational	A repeating decimal

Module 2: Exponents and Pythagorean Theorem |

Simplify the following using the properties of exponents.

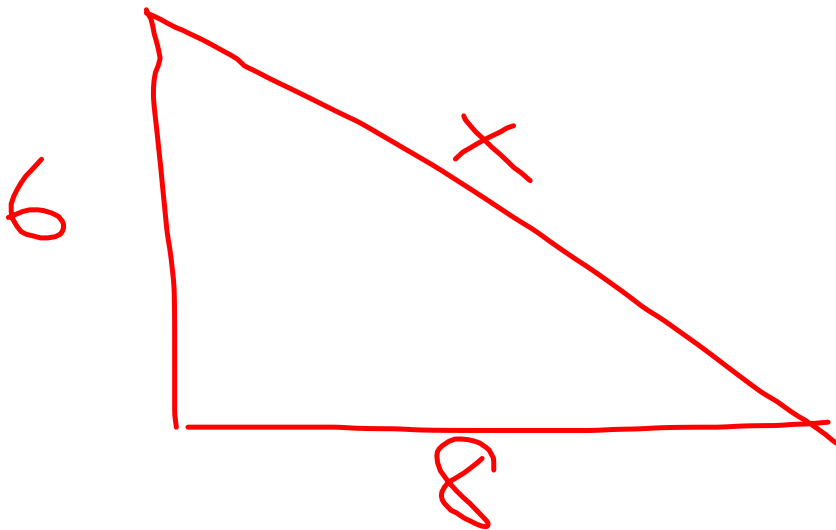
$$13. (x^3)^4 = \underline{x^{12}}$$

$$14. \frac{x^{10}}{x^6} = \underline{x^4}$$

$$15. \frac{4x^5y^{28}}{y^5} = \underline{4x^5y^{23}}$$

Pythagorean Theorem

16. The slide at the playground has a height of 6 feet. The base of the slide measured on the ground is 8 feet. What is the length of the sliding board? (Hint: Draw a picture)



$$a^2 + b^2 = c^2$$

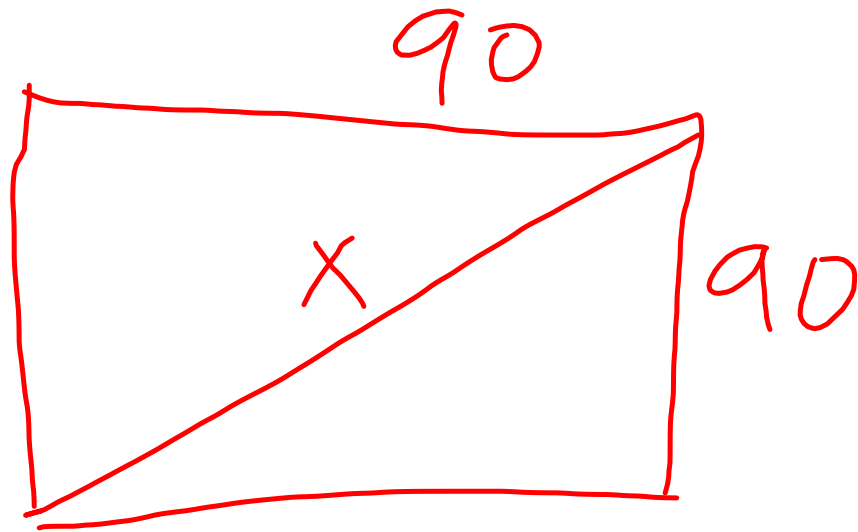
$$6^2 + 8^2 = c^2$$

$$36 + 64 = 100$$

$$c = \sqrt{100}$$

$$c = 10 \text{ ft}$$

17. A baseball "diamond" is actually a square with sides of 90 feet. If a runner tries to steal second base, how far must the catcher, at home plate, throw to get the runner "out"? (Hint: Draw a picture)



$$\begin{aligned} X &= \sqrt{90^2 + 90^2} \\ &= \boxed{127.28 \text{ ft}} \end{aligned}$$

Module 3: Proportions and Unit Rates

18. For three people, there are 15 candy bars. 1 person?

$$\frac{\text{Cb}}{\text{p}} : \frac{15}{3} = \frac{x}{1}$$

$$\cancel{3}x = \frac{15}{\cancel{3}}$$

$$x = 5 \text{ candy bars} / \text{person.}$$

19. According to a survey, 7 out of 10 mothers used daycare. In a group of 150 mothers, how many would you predict would use day care?

$$\frac{7}{10} = \frac{x}{150} = 1050$$

$$\frac{10x}{10} = \frac{1050}{10}$$

Graphing Unit Rates (Compare proportions in multiple representations)

20. Given the following situation: Rhonda was paid \$35 for 7 hours of babysitting,

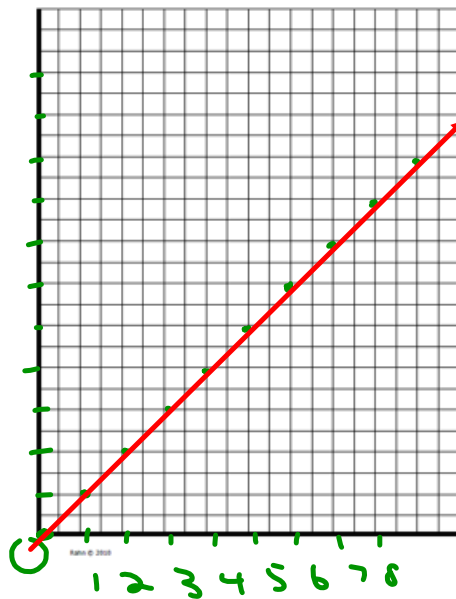
a) Create a table for the proportional relationship.

# hrs	\$
0	0
1	5
2	10
3	15
4	20
5	25
6	30
7	35
8	40

b) Determine the unit rate (constant of proportionality).

$$\frac{35}{7} = 5 \text{ \$5/hr}$$

c) Create a graph



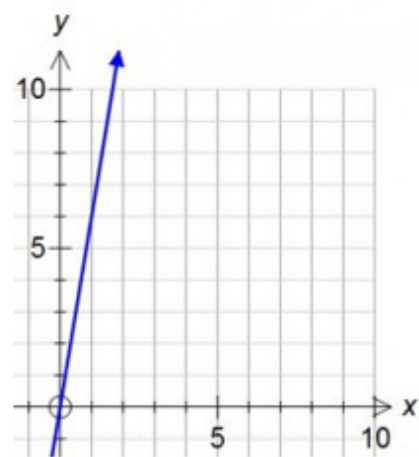
d) Write an equation for the situation.

$$y = kx$$

$$y = 5x$$

21. Write the slope & equation of the line

$$\text{slope} = \frac{6}{1}$$
$$\boxed{y = 6x}$$



Module 4: Equations and Inequalities and Customary and Metric Conversions

Solve the equation.

22. $7x = 98$

23. $x - 5 = 43$

$$\begin{array}{r} +5 +5 \\ \hline x = 48 \end{array}$$

24. A weight-lifter's maximum amount he can lift is 300 pounds. Write and solve an inequality to find the number of 50-pound weights he can possibly lift.

$$\frac{50x}{50} \leq \frac{300}{50} \quad x \leq 6$$

Solve and graph the inequality.

25. $x - 4 \geq 5$

$$\begin{array}{r} +4 +4 \\ \hline x \geq 9 \end{array}$$

26. $-4 + x > -13$

$$\begin{array}{r} +4 +4 \\ \hline x > -9 \end{array}$$

B → S multiply S → B ÷

Customary Conversions. Show your work by setting up a proportion.

27. 104 fl. ounces = 13 cups
 $104 \div 8$

28. 6 quarts = 12 pints
 6×2

29. 5.5 feet = 1.83 yards
 $5.5 \div 3$

30. 3,500 pounds = 1.75 tons
 $3500 \div 2000$

Metric Conversions.

K H D B D C M
 g c m

31. 1.43 kg = 1430 g
 1.430

32. 31,432 mm = 31.432 km

33. 650 cL = 6500 mL
 650.0

34. 0.653 dm = 65.3 mm

Unit 1: Relationships between Quantities and Expressions

1.) Find the sum $(3x^2 + 6x - 4) + (6x^2 - 5x + 9)$.

$$9x^2 + x + 5$$

2.) Find the difference $(6x^3 - 7x^2 + x - 15) - (2x^2 - 4)$.

$$6x^3 - 9x^2 + x - 11$$

3.) Multiply the polynomials $(x - 5)(8x + 3)$.

	x	-5
$8x$	$8x^2$	$-40x$
$+3$	$3x$	-15
	$8x^2 - 37x - 15$	

4.) Simplify $\sqrt{75x^5}$

$$5x^2\sqrt{3x}$$

$$\begin{aligned}\sqrt{x^5} &= \sqrt{x^4 \cdot x} \\ &= x^2\sqrt{x}\end{aligned}$$

$$\begin{aligned}\sqrt{x^7} &= \sqrt{x^6 \cdot x} \\ &= x^3\sqrt{x}\end{aligned}$$

$$\begin{aligned}\sqrt{x^3} &= \sqrt{x^2 \cdot x} \\ &= x\sqrt{x}\end{aligned}$$

$$\begin{aligned}\sqrt{x^{11}} &= \sqrt{x^{10} \cdot x} \\ &= x^5\sqrt{x}\end{aligned}$$

$$\begin{aligned}\sqrt{x^{15}} &= \sqrt{x^{14} \cdot x} \\ &= x^7\sqrt{x}\end{aligned}$$

5.) Simplify $17\sqrt{5} - 7\sqrt{45}$.

$$-4\sqrt{5}$$

6.) Simplify $9\sqrt{7} + 4\sqrt{7}$

$$13\sqrt{7}$$

7.) Simplify $(\sqrt{18})(\sqrt{6})$

$$6\sqrt{3}$$

8.) Simplify $\sqrt{5}(7 + \sqrt{12})$

$$2\sqrt{15} + 7\sqrt{5}$$

Unit 2: Reasoning with Linear Equations and Inequalities

9.) You are purchasing paint and paintbrushes for an art project. Tubes of paint cost \$9 each and paintbrushes cost \$5 each. You plan on spending \$45 and purchasing a total of 7 items. Write a linear system that best represents the situation.

$$\begin{aligned} x + y &= 7 \\ 9x + 5y &= 45 \end{aligned}$$

10.) What is the solution to the following system of equations? $\begin{cases} 7x - 2y = -15 \\ 7x - 6y = 25 \end{cases}$

$$\begin{aligned} &7x - 2y = -15 \\ + &(-7x + 6y = -25) \\ \hline &4y = -40 \end{aligned}$$

$7x - 6(-10) = 25$
 $7x + 60 = 25$
 $7x = 25 - 60$
 $7x = -35$

$y = -10$

$(-5, -10)$ $\frac{4y}{4} = \frac{-40}{4}$

11.) What is the solution to the following system of equations? $\begin{cases} -x + 5y = 10 \\ 2x + y = 13 \end{cases}$

$$\begin{aligned} -x + 5y &= 10 \quad | \times 2 \\ 2x + y &= 13 \end{aligned}$$

$$\begin{aligned} -2x + 10y &= 20 \\ + (2x + y &= 13) \\ \hline &11y = 33 \end{aligned}$$

$y = 3$

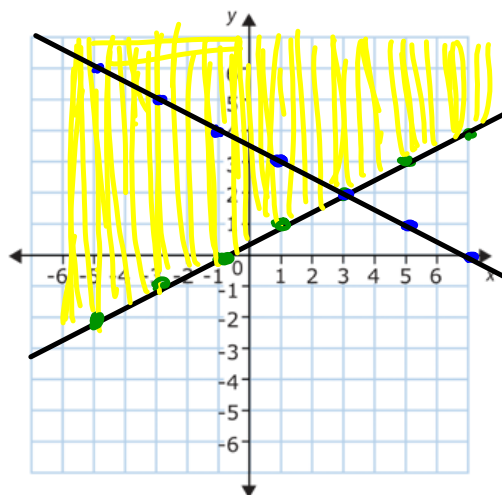
$$\begin{aligned} 2x + 3 &= 13 \\ 2x &= 13 - 3 \\ 2x &= 10 \\ \frac{2x}{2} &= \frac{10}{2} \\ x &= 5 \end{aligned}$$

$(5, 3)$

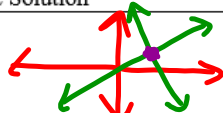
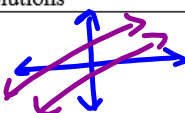
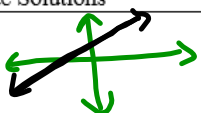
12.) Graph the solution of the following inequality. $\begin{cases} y \geq \frac{1}{2}x + 1 \\ y \leq -\frac{1}{2}x + 3 \end{cases}$

① $m = \frac{1}{2}$ $b = 1$

② $m = -\frac{1}{2}$ $b = 3$



13.) Give an example of the each of the following types of solutions.

	One Solution	No Solutions	Infinite Solutions
Graph			
Equation	$y = -x + 2$ $y = \frac{1}{3}x + 6$	$y = 5x - 3$ $y = 5x + 2$	$y = 3x + 5$ $y = 3x + 5$