

Name: _____

Answer KEY

Per: A/B

Date: _____

Pre Algebra Ch. 5 Group Review

1) Simplify each expression by Combining Like Terms; distribute if necessary. Show supporting work.

$$a) (-3x) - 8y + 3y + 4y - 10x$$

$$-8y + 7y$$

$$\text{Ans: } \boxed{-13x - y}$$

$$c) 5x^2 + 4y - 2z^2 + 4x - 3y + 8z^2 - 7x^2$$

$$\text{Ans: } \boxed{-2x^2 + 4x + y + 6z^2}$$

$$b) (-3) - 8m + 3p + 4m - 10p - 5 + 7p$$

The p's cancel

$$\text{Ans: } \boxed{-4m + 0p - 8 \rightarrow -4m - 8}$$

$$d) (4xy^2) - 6xy - 5 + 2xy + 3x^2y + 7(-9xy^2)$$

$$\text{Ans: } \boxed{3x^2y - 4xy + 5xy^2 + 2}$$

2) Simplify the following expressions using the Distributive Property, then Combining Like Terms if possible.

$$a) 3(6) - 4(2x + 7)$$

← distribute the -4

$$18 - 8x - 28$$

$$\text{Ans: } \boxed{-8x - 10}$$

$$c) -3(2x - 4y - 3) + 8x - 5 - 7y$$

$$-6x + 12y + 9 + 8x - 5 - 7y$$

$$\text{Ans: } \boxed{2x + 5y + 4}$$

$$b) -2 - (d + 3) + 2(2d - 5)$$

$$1 \rightarrow -2 - d - 3 + 4d - 10$$

$$\text{Ans: } \boxed{3d - 15}$$

$$d) 3(4x^2 + 6x + 5) - 2(3x^2 + 2x + 4)$$

$$12x^2 + 18x + 15 - 6x^2 - 4x - 8$$

$$\text{Ans: } \boxed{6x^2 + 14x + 7}$$

3) Which is a better deal: five tulips for \$3 or seven tulips for \$4? Show support work to illustrate why.

$$\text{Ans: } \boxed{7 \text{ for } \$4}$$

\$3 / 5 or \$4 / 7

\$0.60 for 1

$$* \$0.57 \text{ for } 1$$

$$3 \div 5 = .60$$

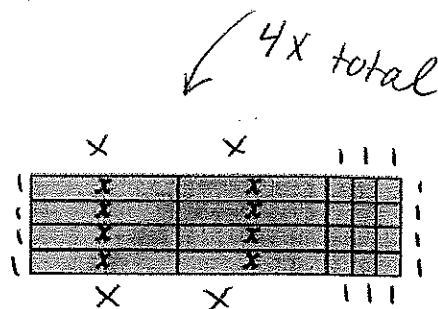
$$4 \div 7 = .57$$

price "per" flower

price flower

4) Use the given figure in each of the following:

- a) Write two algebraic expressions for the PERIMETER of the algebra tiles. One of your expressions should not be simplified, while the second expression should be simplified (by combining like terms).



Un-simplified: $x + x + x + x + 1 + 1 + 1 + 1 + 1 + 1 + 1 + 1$ Simplified: $4x + 14$

- b) Write two algebraic expressions for the AREA of the algebra tiles. One of your expressions should include parentheses, while the second expression should not.

The tiles are named by their areas! CLT!

Un-simplified: $4x + 4x + 3 + 3 + 3 + 3$ Simplified: $8x + 12$

5) Simplify each using Order of Operations. PEMDAS Left to Right!

a) $12 + 8 \cdot 3^2 \div 4(9 - 2)$

$12 + 8 \cdot 9 \div 4(7)$

$12 + 72 \div 4(7)$

$12 + 18(7) \rightarrow 12 + 126$

Ans: $\boxed{138}$

b) $4^3 \div 2^2 - 3(2 \cdot 2) - 3(5^2 - 3^3)$

$64 \div 4 - 3(4) - 3(25 - 27)$

$16 - (12) - 3(-2)$

Ans: $16 - 12 + 6 \rightarrow \boxed{10}$

c) $6 \div (4 \div 2) \cdot 2 - 6 \cdot 2(4 - 6 \cdot 2)$

$6 \div (2) \cdot 2 - 12(4 - 12)$

$3 \cdot 2 - 12(-8)$

$6 + 96$

Ans: $\boxed{102}$

d) $\frac{8 - 2(6 - 4^2 \div 2)}{2 - (4 \div 2 - 4)}$

$\frac{8 - 2(6 - 16 \div 2)}{2 - (2 - 4)}$

$\frac{8 - 2(6 - 8)}{2 - (-2)}$

$\frac{8 - 2(-2)}{2 + 2}$

$\frac{12}{4} \rightarrow \boxed{3}$

Ans:

$\frac{8 + 4}{4}$

6) Fill in the table with the missing form of the number.

ABCDEFGHIJKLMNO P Q ...

Decimal

Percent

Decimal	Percent
0.45	45%
0.675	%
0.08	8%
.375	37.5%
0.005	0.5%

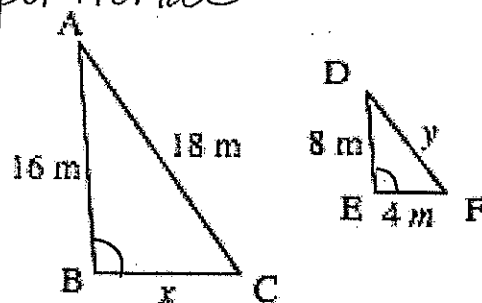
7) Triangles ABC and DEF are similar. \leftarrow 4's are = sides are proportional \smile

a) By what ratio was triangle DEF enlarged to create triangle ABC?

Ratio: by 2 or $\frac{2}{1}$

b) What is the ratio of the side lengths of triangle ABC to triangle DEF?
(This is the opposite of part a).

Ratio: $\frac{2}{1}$ \longleftarrow $\frac{2}{1}$ $\frac{ABC}{DEF}$



c) Calculate the lengths of the missing sides of triangles ABC and DEF. Show all supporting work.

Length: $y = 9m$
 $x = 8m$

$$y = 18/2 \rightarrow 9$$

$$x = 2(4) \rightarrow 8$$

multiply

OR $x = .45(200)$

Direct Translation \smile

8) Identify the equation that could be used to calculate 45% of 200, then solve for x.

a) $\frac{45}{200} = \frac{x}{100}$

b) $\frac{x}{200} = \frac{45}{100}$

c) $\frac{x}{45} = \frac{100}{200}$

d) $\frac{200}{45} = x$

$$\begin{array}{r} 200 \\ \times .45 \\ \hline 1000 \\ + 8000 \\ \hline \end{array}$$

Ans: $\boxed{90}$

$$\frac{100x}{100} = \frac{200(45)}{100}$$

$$x = 2(45) = 90$$

9) A model train engine is 6 inches long. The real train engine is 42 feet long.

$$\rightarrow 42(12 \text{ in}) = 504$$

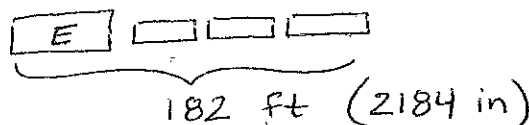
a) What is the scale factor in inches.

Model: $\frac{6 \text{ in}}{42 \text{ ft}} \rightarrow \boxed{\frac{1}{7}}$

Actual: $\frac{42 \text{ ft}}{6 \text{ in}} \rightarrow \boxed{7}$

Scale Factor: order matters

b) What is the length of the model, if the train engine and three cars are 182 feet long?



Ans: $\boxed{26 \text{ in}}$ $\leftarrow 182 \div 7$

10) There are 36 green, 22 white, 30 purple and 14 blue gumballs in the gumball machine. Calculate each:

a) P(white gumball)

$$\frac{22}{102} = \frac{11}{51}$$

Ans: $\boxed{11/51}$

b) P(green gumball)

$$\frac{36}{102} \div 2 = \frac{18}{51} \div 3$$

Ans: $\boxed{6/17}$

c) P(white or green gumball)

ADD $\frac{22+36}{102}$

Ans: $\boxed{29/51}$

$$\frac{58}{102} \div 2$$

$$\frac{29}{51}$$

* $\boxed{\text{Total gumballs} = 102}$

This is called

Independent Event

11) Amy reached into a bag, recorded the color of the tile she picked, returned the tile and then drew again. Below is a list of the tiles she's drawn so far. Based on this data answer the following:

Experimental Probability

red, red, blue, yellow, blue, red, green, red, blue, green

a) P(next draw is red)

$$\frac{4}{10} = \frac{2}{5}$$

Ans:

$$\frac{2}{5} \text{ or } 40\%$$

b) P(next draw is not blue)

$$P(Y, R, G)$$

$$\frac{7}{10}$$

Ans:

$$\frac{7}{10} \text{ or } 70\%$$

c) If she draws 70 more times, how many times would you expect a green?

$$\frac{2}{10} \rightarrow \frac{?}{70}$$

10 * 7 2(7) = 14

Ans:

$$14$$

12) Aiden has one bag with 6 blueberry and 4 raspberry gummy worms. He has another bag with 4 red and 8 black licorice sticks. If he takes one gummy worm and one licorice out of each bag, what is the probability that he will get a raspberry gummy worm and a red licorice?

Multiply

Reduce!

$$\frac{4}{10} \cdot \frac{4}{12} \rightarrow \frac{2}{5} \cdot \frac{1}{3} = \left(\frac{2}{15} \right)$$

Ans:

$$\frac{2}{15}$$

13) Lily only wears pants and sweatshirts to school, and she likes to choose her clothes at random. She has three blue, four brown, and five denim pants. Additionally, she has four white, two gray, and three black sweatshirts. Use any method you choose to calculate the following probability:

P(brown pants with a white sweatshirt) = P(brown pants and white sweatshirt)

multiply the probabilities

Ans:

$$\frac{4}{27}$$

$$\frac{4}{12} \cdot \frac{4}{9} \rightarrow \frac{1}{3} \cdot \frac{4}{9} = \frac{4}{27}$$

14) You're rolling a number cube (1-6) and flipping a fair coin.

a) Make an outcome grid for this situation, then make a systematic list showing all possible outcomes.

2 x 6 "table"
Grid

	1	2	3	4	5	6
H	1H	2H	3H	4H	5H	6H
T	1T	2T	3T	4T	5T	6T

b) Find P(4 and H)

Ans:

$$\frac{1}{12}$$

multiply or use the grid to count

$$2(6) = 12 \text{ total}$$

15) Simplify each of the following:

a) $4\frac{1}{3} \div 1\frac{1}{2}$

\downarrow
 $\frac{13}{3} \div \frac{3}{2}$

$\boxed{26/9}$

Ans:

$\frac{13}{3} \cdot \frac{2}{3}$
 $\frac{26}{9}$

copy change
flip

b) $6\frac{4}{5} \cdot 2\frac{1}{3}$

$\frac{34}{5} \cdot \frac{7}{3} = \frac{238}{15}$

$\boxed{\frac{238}{15}}$

Ans:

support work

$\begin{array}{r} 2 \\ 34 \\ \times 7 \\ \hline 238 \end{array}$

c) $\frac{7}{12} - 3\frac{3}{4}$

$\frac{7}{12} - \frac{15 \cdot 3}{4 \cdot 3}$

$\boxed{-19/6}$

Ans:

OR
 $\boxed{-3\frac{1}{6}}$ Reduce this!
 $\frac{7}{12} - \frac{45}{12} = \frac{-38}{12}$

d) $8\frac{2}{3} + 5\frac{3}{4}$

$8\frac{8}{12} + 5\frac{9}{12} = 13\frac{17}{12}$

$\boxed{14\frac{5}{12}}$

Ans:

LCD is 12

\downarrow
 $14\frac{5}{12}$

16) The sum of three consecutive ~~odd~~^{even} numbers is 72. What are the numbers. Use the 5D process and the table below to find your answer, then write an equation that represents the situation. Solve the equation to verify your correct answer.

Define			Do	Decide
1st Even #	2nd Even #	3rd Even #	sum \rightarrow (Add)	
22	$(22) + 2 = 24$	$(22) + 4 = 26$	72	Perfect ☺
x	$(x) + 2$	$(x) + 4$	sum = 72	
18	20	22	= 60	\downarrow too small
20	22	24	= 66	\downarrow too small

Answer: 22, 24, 26 ✓



17) Christina and Sarah went on a fishing trip and caught 31 fish. Christina caught one less than three times as many fish as Sarah caught. Set up a 5D table to figure out how many fish each girl caught. Then write an equation that represents this problem and solve it to verify your correct solution.

	(x)	(3x-1)	(31)
	Sarah	Christina	Total
✓	(8)	3(8)-1	8+23 = 31 ☺
x	7	3(7)-1	7+20 ↓ too small
x	5	3(5)-1	5+14 ↓ too small

FISH:

Sarah 8 and Christina 23

$$x + 3x - 1 = 31$$

$$4x - 1 = 31$$

$$\begin{array}{r} 4x - 1 = 31 \\ +1 \quad +1 \\ \hline 4x = 32 \\ \frac{4x}{4} = \frac{32}{4} \\ x = 8 \end{array}$$

18) Tilly and Lilly worked together on a job. Tilly earned twice as much as Lilly and together they earned \$510. How much did each person earn? Use the 5D process to solve this problem. Then write an equation that represents this problem and solve it to verify your correct solution.

Describe/Draw

- Lilly = L
- Tilly = 2L

Total 510

DO

Lilly earned \$170
 Tilly earned \$340

DECIDE

Lilly (L)	Tilly (2L)	Total 510
100	2(100)	300 ↓ ☹
150	300	450 ↓ ☹
170	340	510 ☺

DEFINE

Declare:

$$2L + L = 510$$

this was optional ☺

19) The perimeter of this triangle is 39 ft for x.

$$9 + 12 + 18 = 39$$

Given

Long side $\Rightarrow 2x = 18$ ft

$x = 9$

So, the short side is 9 ft and the medium side is 12 ft.

