Ans. Key

Math 115 Exam. 1 Name _____

Instructions: Show all of your work. Reduce answers to lowest terms.

1 & 2 Write the expression as a unit rate.

1. 100 yds in 9 seconds. 11.11 yd/sec

2. $9000 for 250 shares. $36/sh

3. Which is more economical to buy, 20 oz. of Ketchup for $2.29, or 31 oz. for $3.07? Justify your answer by showing both unit prices.

		Price/oz.
20 oz.	$2.29	$.1145/oz
31 oz.	$3.07	$.099/oz

← cheaper
↖ more economical

4. If your car can travel 78.5 miles on 3 gallons of gasoline, how far can it travel on 15 gallons of gasoline?

$\frac{78.5 \text{ mi}}{3 \text{ gal}} = \frac{x}{15}$

$3x = 15(78.5)$

$3x = 1177.5$

$x = 392.5 \text{ mi}$

5. The ratio of weight on the moon to weight on Earth is 1:6. How much would a 200 lb. person weigh on the moon?

$\frac{1}{6} = \frac{x}{200}$

$6x = 200$

$x = 33.33 \text{ lb}$

6. If a $200 item is reduced by 25%, how much does it cost on sale?

$25\%(\$200) = .25(200) = \$50$

$\$200 - \$50 = \$150$

7. $\frac{7}{12} = \frac{25}{x}$ Solve for x.

$7x = 12(25) \rightarrow$

$7x = 300$

$x = 42.86$

8. $\frac{120}{y} = \frac{144}{25}$ Solve for y.

$144y = 25(120)$

$144y = 3000$

$y = 3000/144$

$y = 20.83$

9. The dosage of a medication is 2 milligrams for every 90 pounds of body weight. How many milligrams are required for a person who weighs 220 pounds?

$$\frac{2}{90} = \frac{x}{220}$$

$$2(220) = 90x \rightarrow x = 4.89$$
$$440 = 90x$$

10. Two sets are said to be equal:
a) only if they both equal the Universal set.
b) if they have the same number of elements
c) if they have exactly the same elements
Ans. c

11. What do we call the set that has no elements? The null set.

a) $A \cup B$
b) U
c) $A \cap B$

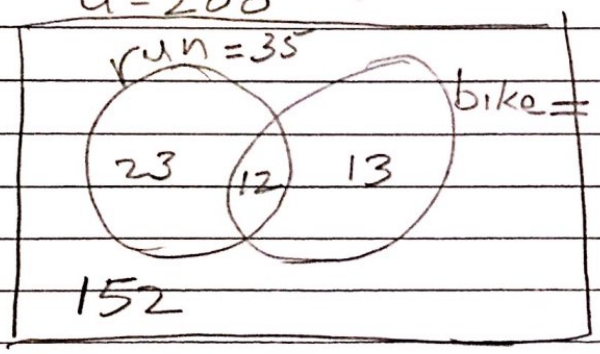
Which represents the set operator, Union? a
(a/b/c)

12. In your own words describe the Complement of set A.
A' is the set of elements in U but not in A.

13. A recent survey of 200 students showed that: 35 run regularly
25 bike "
12 do both "
Make a Venn diagram showing the given information. Be sure to show the universe and how many of the 200 are neither riders or runner.

14. Using data from #13, What percent of the 200, neither run nor ride regularly?

(13)



$\begin{array}{r} 23 \\ 12 \\ +13 \\ \hline 48 \end{array}$ $\begin{array}{r} 200 \\ -48 \\ \hline 152 \end{array}$

(14) $\frac{152}{200} = .76$ or 76%

15. Find the constant of variation when Y varies directly as X and $y=15$ when $X=3$

$y = kx$

$15 = k3$

$k = 5$

16. Given that L varies directly as P, and $L=24$ when $P=21$, find P when $L=80$.

$L = kP$

$24 = k(21)$

$k = 24/21 = \frac{8}{7}$

$80 = \left(\frac{8}{7}\right) P$

$P = 70$

17. Given that W is directly proportional to the square of V, and $W=50$ when $V=5$, find W when $V=12$.

$W = kV^2$

$50 = k\,5^2$

$k = 2$

$W = 2V^2$

$W = 2(12)^2$

$W = 2 \cdot 144 = 288$

18.-19 Evaluate the truth of the following statements given, P is true, q is false and r is false.

18. $(P \wedge q) \vee (P \vee q)$

$(T \wedge F) \vee (T \vee F)$

$(F) \vee (T)$

T

True

19. $P \wedge \sim q$

$T \wedge \sim(F)$

$T \wedge T$

T

True

20. Construct a truth table for the following:

$(q \wedge \sim p) \vee \sim q$

p	q	~p	~q	(q ∧ ~p)	∨	
T	T	F	F	F	F	F
T	F	F	T	F	T	T
F	T	T	F	T	T	F
F	F	T	T	F	T	T

21. Create a truth table for the following.

$(p \vee q) \vee r$

p	q	r	(p ∨ q)	∨	
T	T	T	T	T	T
T	T	T	T	T	F
T	T	F	T	T	T
T	T	F	T	T	F
F	T	T	T	T	T
F	T	T	T	T	F
F	F	F	T	T	T
F	F	F	F	F	F