

Algebra 1st Semester Exam Review

Name: Key

Section 1.1

- 1) Write a verbal expression for the following mathematical expression:
 $2n + 7 = 11$ Two times a number n plus seven is equal to eleven.
- 2) Write a verbal expression for the following mathematical expression:
 $x^2 - 4 = 8$ The difference of the square of a number x and four is equal to eight.
- 3) Write a mathematical expression for the given verbal expressions:
a) Three times a number decreased by 6 is equal to 12
 $3x - 6 = 12$
b) Five times a number increased by 9 is 25.
 $5n + 9 = 25$

Section 1.2

4) Evaluate the following expressions:

a) $4^2 - 5 \cdot 3$
 $16 - 15 = \boxed{1}$

b) $2^4 + 3 \cdot 2$
 $16 + 6 = \boxed{22}$

c) 5^4
 $5 \cdot 5 \cdot 5 \cdot 5 = \boxed{625}$

Section 1.3

5) Find the solution set of the following if the replacement set $n = \{1, 3, 5\}$ $2n - 4 = 2$

$2(1) - 4 \stackrel{?}{=} 2$
 $-2 \neq 2$

$2(3) - 4 \stackrel{?}{=} 2$
 $6 - 4 \stackrel{?}{=} 2$
 $2 = 2 \checkmark$

$2(5) - 4 \stackrel{?}{=} 2$
 $10 - 4 \stackrel{?}{=} 2$
 $6 \neq 2$
 $\boxed{\{3\}}$

6) Find the solution set of $x - 4 > 3$ if the replacement set is

$x = \{6, 7, 8, 9, 10\}$

$6 - 4 > 3$
 $2 > 3$
 $7 - 4 > 3$
 $3 > 3 /$

$8 - 4 > 3$
 $4 > 3 \checkmark$

$\boxed{\{8, 9, 10\}}$

Section 1.4

7) What is the multiplicative identity property?

$$n \cdot 1 = n \quad 3 \cdot 1 = 3$$

8) What is the additive identity property?

$$n + 0 = n \quad 3 + 0 = 3$$

9) What is the mult. prop. of zero?

$$n \cdot 0 = 0 \quad 3 \cdot 0 = 0$$

10) What is the additive inverse property?

$$n + -n = 0 \quad 3 + -3 = 0$$

11) What is the reciprocal property?

$$n \cdot 1/n = 1 \quad 3 \cdot 1/3 = 1$$

Section 1.5

12) Simplify using distributive property $-2(3x - 1)$

$$\boxed{-6x + 2}$$

13) Simplify: $5(3x + 4y)$

$$15x + 20y$$

14) Simplify: $4x^2 + 2x - 1x^2 + 3x + 5$

$$3x^2 + 5x + 5$$

Section 2.1

15) Please list the following sets of numbers:

a) natural/counting: $\{1, 2, 3, 4, \dots\}$

b) whole: $\{0, 1, 2, 3, 4, \dots\}$

c) integers: $\{\dots, -3, -2, -1, 0, 1, 2, 3, \dots\}$

16) Please give an example of:

a) rational number:

$$1/4$$

b) irrational number

π (has decimal w/ no pattern or repeats)

17) all rational numbers are real numbers but not all real numbers are rational.

True or False

18) Evaluate $|-4| + 3 =$ 7
 $4 + 3 =$ 7

Section 2.2-2.4

19) Evaluate:

a) $4 - (-7)$

$4 + 7 =$ 11

b) $-3 + 6$

3

c) $-5 - 11$

-16

20) Simplify the following:

a) $\frac{100 - 20}{4}$
 $\frac{100}{4} - \frac{20}{4}$
 $49 - 5$

b) $\frac{12 + 15x}{3}$ $\frac{12}{3} + \frac{15x}{3}$
 $4 + 5x$

Section 2.5

21) What is the mean, median and mode of the following set:

5, 6, 6, 7, 8, 8, 8, 9, 10, 10, 13, 13, 13, 13, 14, 15, 15 # of terms? 17

mean: 10.18
 $173/17$

median: 10

mode: 13

Section 2.6

22) In a standard deck of cards there are 52 cards. There are 4 suits: hearts, diamonds, spades & clubs. There are 13 cards in each suit: 2, 3, 4, 5, 6, 7, 8, 9, 10, Jack, Queen, King, Ace.

a) What is the probability of pulling a 7 out of the deck?
 (probability = $\frac{\# \text{ ways possible}}{\text{total \#}}$) $\frac{4}{52} = \frac{1}{13} = .0769$

OR 7.69%

b) What are the odds of drawing a diamond?

(odds = $\frac{\# \text{ ways can happen}}{\# \text{ ways can't happen}}$) $\frac{13}{52-13} = \frac{13}{39} = .3333$

33.3%

Section 2.7

23) Find the $\sqrt{64}$ (what number times itself equals 64)
 $\boxed{\pm 8}$

24) Graph $x > -1$ on a number line



25) Graph $x \leq 3$ on a number line



26) Put the following in order from least to greatest: $|-3|$, $\frac{1}{2}$, -4 , $\sqrt{4}$, 3.2
 $-4, \frac{1}{2}, \sqrt{4}, |-3|, 3.2$

Section 3.2

27) Solve:

a) $x + 12 = 8$
 $\frac{-12}{-12} \quad \frac{-12}{-12}$
 $x = -4$

b) $x - 4 = 5$
 $\frac{+4}{+4} \quad \frac{+4}{+4}$
 $x = 9$

c) $x + 3 = -7$
 $\frac{-3}{-3} \quad \frac{-3}{-3}$
 $x = -4$

Section 3.3

28) Solve:

a) $\frac{5}{8}x = \frac{15}{5}$
 $\frac{5}{5} \quad \frac{5}{5}$
 $x = 3$

b) $-\frac{6}{10}x = \frac{12}{-6}$
 $\frac{-10}{-10} \quad \frac{-10}{-10}$
 $x = -2$

c) $(\frac{2}{3}x) = (4) \cdot \frac{3}{2}$
 $x = \frac{12}{2} = 6 = x$

Section 3.4

29) Solve:

a) $3x + 7 = 5$
 $\frac{-7}{-7} \quad \frac{-7}{-7}$
 $\frac{3x}{3} = \frac{12}{3} \quad x = 4$

b) $5x + 4 = 14$
 $\frac{-4}{-4} \quad \frac{-4}{-4}$
 $\frac{5x}{5} = \frac{10}{5}$
 $x = 2$

c) $-2x + 5 = 19$
 $\frac{-5}{-5} \quad \frac{-5}{-5}$
 $\frac{-2x}{-2} = \frac{14}{-2}$
 $x = -7$

Section 3.6

30) Tell whether the following proportions are equal (cross multiply)

a) $\frac{3}{4} \neq \frac{5}{8}$

$3 \cdot 8 \stackrel{?}{=} 4 \cdot 5$
 $24 \stackrel{?}{=} 20$ $\boxed{\text{NO}}$

b) $\frac{4}{7} \times \frac{12}{21} \quad 84 \stackrel{?}{=} 84$ $\boxed{\text{yes}}$

31) Solve:

a) $\frac{n}{5} \neq \frac{4}{10}$
 $\frac{10n}{10} = \frac{20}{10}$ $\boxed{n=2}$

b) $\frac{n}{7} \neq \frac{4}{3} \quad \frac{3n}{3} = \frac{28}{3}$ $\boxed{n=28/3}$

Section 3.7

32) Find the percent of change if the following is true: $\left(\frac{n-o}{o}\right)$

a) original: \$20
new: \$28

$$\frac{28-20}{20} = \frac{8}{20} = \frac{4}{5}$$

40% increase

b) original: \$24
new: \$8

$$\frac{8-24}{24} = \frac{-16}{24}$$

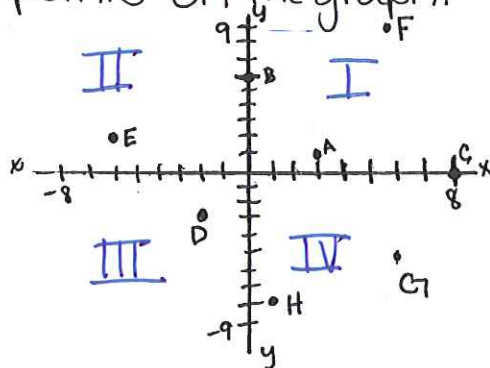
$$= -\underline{.6667}$$

66.67% decrease

Section 4.1

33) Write the coordinates of the following points on the graph.

- a) A (3,1)
- b) B (0,6)
- c) C (8,0)
- d) D (-2,-3)
- e) E (-6,2)
- f) F (6,9)
- g) G (6,-5)
- h) H (1,-8)

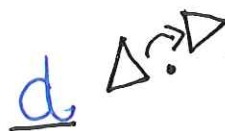
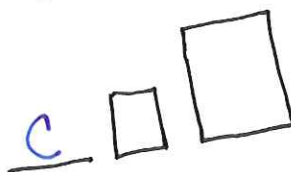
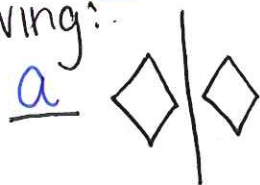


34) Please label all four quadrants on this graph. ↗

35) To plot the point (4,1), start at the origin and move 4 units right and 1 unit up. True / False

36) Label/Match the following:

- a) reflection
- b) translation
- c) dilation
- d) rotation



37) A line segment with points M(-2,0) & N(-1,2) is translated 2 units up, what are the new coordinates? (add 2 to the y)

M'(-2,2) N'(-1,4)

38) What is the inverse of the following relation? (3,1)(2,4)(5,3)(-4,8)

(1,3)(4,2)(-3,5)(8,-4)

39) Write an example of the following:

a) a linear equation (no $x \cdot y$, no x/y , no power greater than 1)

$$y = 3x - 4$$

b) a non-linear equation

$$10 = xy + 7$$

40) Please give an example of the following

a) a relation that is a function:

$$(4, 2) (1, 3) (5, 3) (7, 8)$$

b) a relation that is not a function

$$(1, 2) (1, 7) (2, 5) (3, 4)$$

41) If $h(r) = 3r - 4$, find $h(5)$.

$$h(5) = 3(5) - 4 \quad 15 - 4 = \boxed{11}$$

42) If $g(x) = 2x + 9$, find $g(-3)$.

$$2(-3) + 9 \quad -6 + 9 = \boxed{3}$$

43) Which is the following ~~one~~ is an arithmetic sequence?

(a) $2, 5, 8, 11, \dots$

$$+3 \quad +3 \quad +3$$

b) $1, 2, 4, 7, \dots$

$$+1 \quad +2 \quad +3$$

c) $-4, -1, 0, 3, 4, 7, \dots$

$$+3 \quad +1 \quad +3 \quad +1 \quad +3$$

44) Find the 112th term of the following sequence?

$$-3, 1, 5, 9, \dots$$

$$+4 \quad +4 \quad +4$$

$$* a_n = a_1 + (n-1)d$$

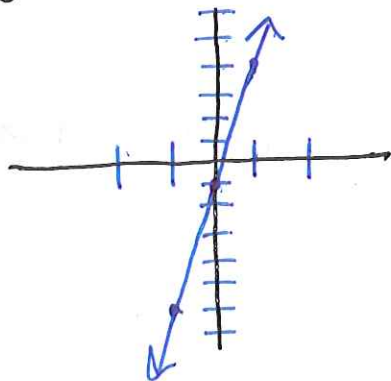
$$a_{112} = -3 + (112-1)4$$

$$-3 + 444 = \boxed{441}$$

45) Graph the following:

a) $y = 5x - 1$

x	y
-1	-6
0	-1
1	4



$$y = 5(-1) - 1$$

$$-5 - 1 = -6$$

$$5(0) - 1 = -1$$

b) $4x - 2y = 18$

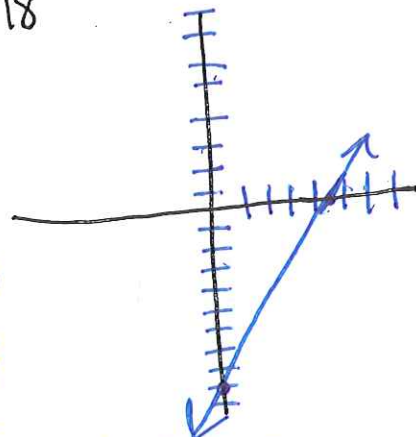
x	y
0	-9
9/2	0

$$4(0) - 2y = 18$$

$$-2y = 18$$

$$\frac{-2y}{-2} = \frac{18}{-2}$$

$$y = -9$$



$$4x - 2(0) = 18$$

$$\frac{4x - 18}{4} = \frac{x - 9/2}{4}$$

(6)