REVIEW TEST 1 - Chapters 1, 2, 3 (3.1 – 3.5), and 4 (4.1 – 4.4)

To prepare for the test, study the following exercises:

Homework Chapters 1, 2, 3, and 4 - all exercises

Handout Chapter 1 – Exercises # 2, 12, 14, 15, 16

Handout Sections 2.4 & 2.5 , Handout 3.1 & 3.2 , **Handout 3.3 –** All exercises (see website for Handouts)

More practice:

I Simplify the expressions:

1. $(5w^3)(3w^5)$ **2.** $(-8xy)(x^5y^4)(-4xy)$ **3.** $x-5[x-5(x-5)]$

4. $5(a-1)-4[2a-4(a-3)]$ **5.** $4(2x^2-4y)+(8(5y-3x^2)$ **6.** $(-8x^2y)(-xy^4)(-4x^2y)$

7. $x^2y(xy-x)-7xy(x^2y-x^2)$ **8.** $6(8x-3)-9(4-x)$ **9.** $(-c^4)(3^3)(-2c)$

10. $4a(a^2+3b)+5b^2(a^2-b)$ **11.** $\dfrac{|-8-4|\div(2-2^2)}{-18\div(-3)^2+|-8|-|-4|}$ **12.** $x\left[2x^2+x\left(x-3\left(x-1\right)\right)\right]$

13. $c^3(2c-3)-c^2\left(c^2-8c\right)$

II Evaluate the expressions:

1. (x+y)z – (x –y- z) +x –(y – z) when: x = - 3 ; y = - 4; z = 5;

2. $\dfrac{5y-6}{2x+1}$ when: x = -4; y = -3 **3.** xy + x^2 when: $x=-\dfrac{2}{3}, y=\dfrac{4}{5}$

III Translate each phrase into on algebraic expression involving one variable.

a) The sum of the squares of two consecutive odd numbers b) Half of the sum of a number and 6

c) Five less than twice a number is -3 d) The sum of three times a number and 7

IV Write a simplified algebraic expression for the described quantity (Define your variable)

a) The perimeter of a rectangle if the length is four more than the width.

b) The value in cents of a collection of twenty nickels and some dimes

V Solve each equation:

1. $-3(x-5)-2x=5(3-x)+4x$ **2.** $\dfrac{4}{11}-2y+5y=\dfrac{9}{11}+y$ **3.** $\dfrac{5}{6}=\dfrac{2u-3}{5}$

4. $\dfrac{3(n-2)}{5}=\dfrac{3n+6}{6}$ **5.** $\dfrac{5}{6}x-\dfrac{2}{3}=\dfrac{1}{2}$ **6.** $\dfrac{10(y+2)}{7}=2y-4$

7. $9(4y-3)=6(6y-4)-3$ **8.** $\dfrac{2}{3}(v-4)=2$ **9.** $\dfrac{x+1}{3}=5-\dfrac{x+2}{7}$

VI – Solving Linear Inequalities in two variables (Section 2.8)

For exercises 1 -18 , do the following:

a) solve the following inequalities;

b) graph the solution set on the number line;

c) use interval notation for the solution set.

1) $-2(2x+3)\geq 14$; **2)** $9(a+5)-10(1-a)<14$ **3)** $x-3>2x+3(x-\frac{1}{3})$;

4) $-\frac{2}{5}<\frac{x-4}{3}\leq 4$ **5)** $-1<\frac{x+1}{2}\leq\frac{5}{2}$ **6)** $-1\leq -x+12\leq 50$

7) $-7<-7x\leq 0$ **8)** $-y+2y>y-\frac{1}{2}$ **9)** $2(u+8)-2(u-1)<5$

10) $0.4-0.45(x-2)>0.04$

VII Inequalities. Sets. Intervals.

Graph the following sets and express them using interval notation:

a) $\{x\,|\,x\leq -2\}$ b) $\{x\,|\,2<x\leq 3\}$ c) $\{x\,|-3\geq x\geq -7\}$

VIII - Linear Equations in Two Variables (Sections 3.1, 3.2, 3.3, 3.4)

1. a) What is a linear equation in two variables? Give an example.

b) How do you graph a linear equation in two variables?

c) What coordinate system is used to graph a linear equation in two variables?

2. Graph each equation on a separate rectangular coordinate system by the intercept method. Label each point and axis used.

$a)\ \ y=x-5$ b) $y=3$ c) $3x+4y=12$ d) $2x=y$

e) $x+2(x-3)=-1$

3. Let $4x-y=-1$ be a linear equation in two variables.

a) Complete each ordered pair so that it is a solution of the given equation: i) $(?,-3)$ ii) $\left(\frac{1}{2},?\right)$

b) Graph the equation using the intercepts.

c) What is the slope of the line?

d) Is the ordered pair $(0,-2)$ a solution of the equation? Justify your answer graphically and algebraically.

4.Find the slope of each line a) $\frac{x}{5}-\frac{y}{2}=1$; b) $2y=3$; c) $x+\frac{1}{3}y+1=3$ d) $9x+12y=36$

5. Which of the following tables represent variables that are related by a linear equation? Explain why or why not? If it is linear, find the equation for the table.(Hint: Which relationships have constant slope?) Show all work.

X	Y
2	12
3	17
4	22
5	27
6	32

t	d
5	0
10	3
15	6
20	12
25	24

V	P
-3	-2
-5	3
-9	13
-15	28

6. Write an equation for the line that passes through the given point and has the given slope:$(2,-\frac{1}{2})$, m=4.

Then: a) put your equation into slope-intercept form; b) put your equation in standard form and integer coefficients.

7. Find the slope of the line that is parallel to the line through the pair of points : (-8, -4) and (3,5).

8. Find an equation of the line that passes through the point (-1,2) and is a) parallel to $\frac{5}{18}x+\frac{1}{6}y=\frac{2}{3}$;

b) perpendicular to $\frac{5}{18}x+\frac{1}{6}y=\frac{2}{3}$

9. Tell whether the lines given are parallel, perpendicular, or neither:

a) $y=3x+2$ and $y-2=-\frac{1}{3}(x+1)$; b) a line with slope 5 and a line with slope $\frac{10}{2}$.

10. Are the lines given by these equations parallel, perpendicular or neither? Show all work.

$$y-\frac{2}{3}x=0; \qquad 3y=2x+1$$

IX Systems of Linear Equations in Two Variables (Sections 4.1, 4.2, 4.3, 4.4)

1. Complete each statement.

a) The graph of a linear equation is a _____

b) If the graphs of two different equations are parallel lines, they have _____common solutions.

c) If the graphs of two equations coincide, the equations have_____ common solutions.

d) If the graphs of two equations have one point of intersection, the equations have_____common solutions.

2. a) What is a system of equations? Give an example of a system of two equations in two variables.

b) In your own words, explain what it means to solve a system of two equations in two variables.

c) What are the three methods used to solve a system of linear

3. Solve each system using the substitution method or the addition method.

a) $\begin{cases} 2x+y=1 \\ 5x-y=20 \end{cases}$ b) $\begin{cases} x+3y=25 \\ 2x=y+8 \end{cases}$ c) $\begin{cases} 2x+3y=0 \\ 4x+6y=3 \end{cases}$ d) $\begin{cases} \frac{3x}{4}+\frac{5y}{8}=\frac{10}{4} \\ \frac{x}{4}+\frac{y}{8}=2 \end{cases}$

e) $\begin{cases} -5A=15B+1 \\ A+3B=-5 \end{cases}$ f) $\begin{cases} 9x+3y=5 \\ 3x=4-y \end{cases}$ g) $\begin{cases} -x+5y=-1 \\ 3x-15y=3 \end{cases}$

h) $\begin{cases} -5y+6y=3x+2(x-5)-3x+5 \\ 4(x+y)-x+y=-12 \end{cases}$ i) $\begin{cases} \frac{y}{3}=\frac{x}{2}-3 \\ 2x-4y=0 \end{cases}$ j) $\begin{cases} x-5y=1 \\ -\frac{1}{2}x+\frac{5}{2}y=\frac{3}{4} \end{cases}$

4.Translate each problem into a system of simultaneous equations. Then SOLVE.

a) One number is nine times another. Their sum is 75.

b) The sum of two numbers is 24. One number is six times the other.

c) The length of a rectangle is six times its width. The perimeter of the rectangle is 120 feet.

d) The mathematics department has $40,000 to set up a new computer lab. They will need one printer for every four terminals they purchase. If a printer costs $560 and a terminal costs $1520 , how many of each should they buy?

5. Mary buys 3 six-pack cartons of cola and 2 bags of potato chips for $5.10. She later buys another carton of cola and 3 bags of potato chips for $3.20. What is the price of a carton of cola? What is the price of a bag of potato chips?

6.A biologist has two brine solutions, one containing 10% salt and another containing 30% salt. He wants to mix the two solutions together to make 1 liter of a solution that is 15% salt. Set up and solve a system of equations to find how much of the 10% solution and how much of the 30% solution he should use.

7. A boat can travel 24 miles downstream in 2 hours and can make the return trip in 3 hours. Find the speed of the boat in still water.

Answers:

I Simplify the expressions:

1. $15w^2$ 2. $32x^7y^6$ 3. $21x-125$ 4. $13a-53$ 5. $-16x^2+24y$ 6. $32x^5y^6$ 7. $-6x^3y^2+6x^3y$
8. $57x-54$ 9. $54c^5$ 10. $4a^3+12ab+5a^2b^2-5b^3$ 11. -3 12. $3x^2$ 13. c^4+5c^3

II Evaluate the expressions 1. -25 2. 3 3. -45

III a) $(2x+1)^2+(2x+3)^2$ b) $\frac{x+6}{2}$ c) $2x-5=-3$ d) $3x+7$

IV a) $P=4w+8$ b) $V=20\cdot 5+10x$

V 1) $x=0$; 2) $y=\frac{5}{22}$; 3) $u=\frac{43}{12}$; 4) $n=22$; 5) $x=\frac{7}{5}$; 6) $y=12$; 7) $y\in\mathbb{R}$; 8) $v=7$; 9) $x=\frac{46}{5}$

VI Section 2.8

1. $x\le -5$ $x\in(-\infty,-5]$
2. $a\le -\frac{21}{19}$ $x\in\left(-\infty,-\frac{21}{19}\right)$
3. $x<-\frac{1}{2}$ $x\in\left(-\infty,-\frac{1}{2}\right)$
4. $\frac{14}{5}<x\le 16$ $x\in(\frac{14}{5},16]$
5. $-3<x\le 4$ $x\in(-3,4]$
6. $-38\le x\le 13$ $x\in[-38,13]$
8. $y\in\mathbb{R}$ $y\in(-\infty,\infty)$
9. $u\in f$
10. $x<\frac{14}{5}$ $x\in(-\infty,\frac{14}{5})$

VII a) $x\in(-\infty,-2]$ b) $x\in(2,3]$ c) $x\in[-3,-7]$

VIII 3. a) i) $(-1,-3)$ ii) $(\frac{1}{2},3)$ c) $m=12$ d) NO $4\cdot 0-(-2)=2\ne -1$

4. a) $m=\frac{2}{5}$ b) $m=0$ c) $m=-3$ d) $m=\frac{-3}{4}$ 5. $X-Y$ $m=5$ and $V-P$ $m=-\frac{5}{2}$

6. a) $y=4x-\frac{17}{2}$ b) $-8x+2y=-17$ 7. $m=\frac{9}{11}$ 8. a) $y=-5x-3$ b) $y=\frac{1}{5}x+\frac{11}{5}$

9. a) perpendicular b) parallel 10. parallel

IX **3a**. $(3,-5)$ **3b.** $(7,6)$ **3c.** no solutions **3d.** $(15,-14)$ **3e, f.** no solutions

3g. infinitely many solutions **3h**. $(1,-3)$ **3i.** $\left(9,\frac{9}{2}\right)$ **3j.** no solutions

4a. If *x* is one number, *y* the other number, then x+y=75 and x=9y **4c.** If w is the width and l is the length, then l=6w and 2l+2w=120 **5.** \$1.28 a six-pack of cola, \$0.64 a bag of potato chips
6. 3/4l of the 10% solution **7.** 10 mph for boat, 2 mph for