

Math 100 Exam 3, Chapters 1-5, KIRKBRIDE, MTWTh, 8:15-9:20am

Name: Key

Student ID: \_\_\_\_\_

**Instructions: SHOW YOUR WORK and circle your answers**

1. Perform the indicated operation and/or evaluate. (4 points each)

a.  $10 - (-2) - 5$

$$10 + 2 - 5$$

$$12 - 5 = 7$$

b.  $\frac{(3-6) \cdot 4}{(8-7) \cdot 3}$

$$\frac{-3 \cdot 4}{1 \cdot 3} = \frac{-12}{3} = -4$$

c.  $\frac{3}{4} + \frac{5}{3} - 2$

$$\frac{9}{12} + \frac{20}{12} - \frac{24}{12}$$

$$\frac{29}{12} - \frac{24}{12} = \frac{5}{12}$$

d. If  $a = -3$  and  $b = 2$ , find  $a^2 - 2ab + b^2$

$$(-3)^2 - 2(-3)(2) + 2^2$$

$$9 + 12 + 4 = 25$$

2. Simplify the following expressions. (4 points each)

a.  $-[-4 + (3 + 2x)]$

$$-[-4 + 3 + 2x]$$

$$-[-1 + 2x]$$

$$1 - 2x$$

b.  $x(x-1) + 3(x-2)$

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

$$x^2 + 2x - 6$$

3. Solve each equation. (4 points each)

a.  $15 - 4t = 7 - 2t$

$$\begin{array}{r} 15 - 4t = 7 - 2t \\ -7 \quad -7 \\ \hline 8 - 4t = 0 - 2t \\ +4t \quad +4t \\ \hline 8 = 2t \\ 4 = t \end{array}$$

b.  $7(z-2) = -3(4-z)$

$$\begin{array}{r} 7z - 14 = -12 + 3z \\ -3z \quad -3z \\ \hline 4z - 14 = -12 \\ +14 \quad +14 \\ \hline 4z = 2 \\ z = \frac{1}{2} \end{array}$$

$7(-3/2) = -3(7/2) \checkmark$

4. (5 points) Eight subtracted from six times a number is 298. Find the number.

$$\begin{array}{r} 6x - 8 = 298 \\ + 8 \quad + 8 \\ \hline 6x = 306 \\ \frac{6x}{6} = \frac{306}{6} \quad x = 51 \end{array}$$

5. (5 points) Solve the inequality and graph the solution on a number line.

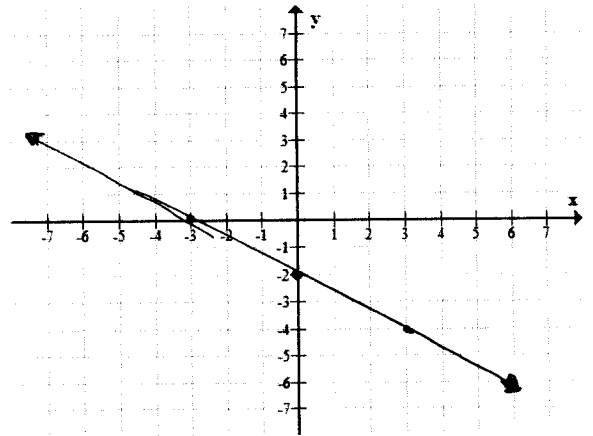
$$\begin{array}{r} -3x - 11 \geq -2x + 1 \\ + 3x \quad + 3x \\ \hline -11 \geq x + 1 \\ -1 \quad -1 \\ \hline -12 \geq x \quad (-\infty, -12] \end{array}$$

6. (5 points) A person's hair length is proportional to the number of years it has been growing. After 2 years, a person's hair grows 8 inches. Stan grew his mustache for 17 years. How long was it?

$$\begin{array}{l} \frac{2 \text{ years}}{8 \text{ inches}} = \frac{17 \text{ years}}{x \text{ inches}} \\ \frac{8 \cdot 17}{2} = \frac{2x}{2} \quad x = 68 \text{ inches} \end{array}$$

7. (6 points) Sketch the graph of the equation  $2x + 3y = -6$

$$\begin{array}{l} 2x + 3y = -6 \\ 3y = \frac{-2x - 6}{3} \\ y = -\frac{2}{3}x - 2 \end{array}$$



8. (6 points) Solve the system of equations.

$$\begin{array}{l} x + 2y = 5 \quad x = -2y + 5 \\ 3x + 6y = 6 \\ 3(-2y + 5) + 6y = 6 \\ -6y + 15 + 6y = 6 \\ 15 = 6 \end{array}$$

Parallel lines

$$\begin{array}{l} 3(-2y + 5) + 6y = 6 \\ -6y + 15 + 6y = 6 \\ 15 = 6 \end{array}$$

9. Perform the indicated operation. (4 points each)

a.  $(-x^2 + x - 9) - (-x^2 - x + 2)$

$$-x^2 + x - 9 + x^2 + x - 2$$

$$2x - 11$$

b.  $-a^2(2a^2 + 6a - 13)$

$$-2a^4 - 6a^3 + 13a^2$$

c.  $(2p - 5)(3p + 2)$

$$6p^2 + 4p - 15p - 10$$

$$6p^2 - 11p - 10$$

d.  $\frac{-64x^3y^{12}}{16xy^2}$

$$-4x^2y^{10}$$

10. (5 points) Use long division to find the quotient.  $\frac{a^3 - 2a^2 + 3}{a - 1}$

$$\begin{array}{r}
 a^2 - a - 1 \quad \overline{) a^3 - 2a^2 + 3a + 3} \\
 \underline{-(a^3 - a^2)} \phantom{+ 3} \\
 -a^2 + 0a \phantom{+ 3} \\
 \underline{-(-a^2 + a)} \phantom{+ 3} \\
 -a + 3 \\
 \underline{-(-a + 1)} \\
 2
 \end{array}$$

11. Simplify each expression. (5 points each)

a.  $\frac{x^6y^4}{x^2y^2}$

$$x^4y^2$$

b.  $(-x^{-1}y^3)(4x^2y)^2$

$$-16x^{-1}x^4y^7y^2$$

$$-16x^3y^9$$

12. (5 points each)

a. Convert the number into scientific notation.

0.00089

$$8.9 \times 10^{-4}$$

b. Convert the number to a decimal.

$2.19 \times 10^7$

$$21,900,000$$