

Section: _____

Group: _____

Name: _____

In problems 1-7 below (valued at 5 points each) indicate your choice by circling the preceding letter. For all other problems, show appropriate work to receive credit (value indicated) and place your answer in the blank provided. Calculators are not allowed on this exam. Formulas you may need on this exam: $D = RT$, $A = l \times w$, $P = 2l + 2w$, $A = \frac{1}{2}bh$, $A = \frac{1}{2}h(b_1 + b_2)$.

1. Solve for y : $\frac{2}{3}y + \frac{1}{2}(y-3) = \frac{y+1}{4}$

- a.) $-15/11$
- b.) $6/5$
- c.) $21/11$
- d.) $60/13$
- e.) None of the above

2. Solve for r : $A = P + Prt$

- a.) $\frac{A - P}{Pt}$
- b.) $\frac{A - P}{P + t}$
- c.) $\frac{A + P}{Pt}$
- d.) $\frac{A}{P + Pt}$
- e.) $A - P - Pt$

3. Solve for x : $\sqrt{x+6} - x = 4$

- a.) 5 and 2 only
- b.) 2 only
- c.) -2 only
- d.) -5 and -2 only
- e.) None of the above

4. Solve for x : $x^4 - 6x^2 + 5 = 0$

- a.) ± 1 and ± 5
- b.) 2 and 3
- c.) -2 and -3
- d.) ± 1 and $\pm \sqrt{5}$
- e.) None of the above

5. The solution of $2(4x + 3) \geq 8 - 4(x - 1)$ is:

- a.) $x \leq -1/2$
- b.) $x \geq 3/2$
- c.) $x \leq -2/3$
- d.) $x \geq 1/2$
- e.) None of the above

6. For what values of x is $\left| \frac{8-3x}{-4} \right| \geq 3$?

- a.) $\left(-\infty, -\frac{4}{3}\right]$ and $\left[\frac{4}{3}, \infty\right)$
- b.) $\left[-\frac{4}{3}, \frac{20}{3}\right]$
- c.) $\left[-\frac{4}{3}, \infty\right)$
- d.) $\left(-\infty, -\frac{4}{3}\right]$ and $\left[\frac{20}{3}, \infty\right)$
- e.) $\left[\frac{20}{3}, \infty\right)$

7. If $f(x) = 2x - 3$, then $\frac{f(x+h) - f(x)}{h} =$

- a.) $\frac{2x+h-3}{h}$
- b.) 2
- c.) 1
- d.) 0
- e.) $2h$

8. If $f(x) = \frac{x}{2x^2 - 4x}$ and $g(x) = \begin{cases} x - 4, & x < 2 \\ x^2, & x > 2 \end{cases}$: (2 points each)

- a.) What is the domain of $f(x)$? _____
- b.) Evaluate $f(-1)$: _____
- c.) What is the domain of $g(x)$? _____
- d.) Evaluate $g(-1)$: _____

9. Give an example of a 3rd degree polynomial function: (2 points) _____

10. State the domain of the function $f(x) = \sqrt{x-1}$: (2 points) _____

11. In the problems below, establish an appropriate *equation* or *inequality* and solve. You will not receive credit for a trial and error solution. (a: 7 points, b: 5 points)

a.) A company produces figurines at a cost of \$3.00 per unit. If fixed costs are \$1,500 per month and each unit sells for \$8, what how many figurines must be sold in a given month to break even?

How many figurines must be sold in a given month in order to earn a profit of \$6,500 in that month?

b.) A fence is to be placed around a rectangular plot so that the enclosed area is 800 ft^2 and the length of the plot is twice the width. What are the dimensions of the plot? How many feet of fencing must be used?

Dimensions: _____

Fencing needed: _____

12. If $f(x) = x^2 - x$ and $g(x) = 2x$, find the following: (2 points each)

a.) $(f + g)(x)$: _____

b.) $(f - g)(x)$: _____

c.) $(f - g)(4)$: _____

d.) $(fg)(x)$: _____

e.) $\left(\frac{f}{g}\right)(x)$: _____

f.) $(f \circ g)(x)$: _____

g.) $(g \circ f)(-4)$: _____

h.) Identify limits on the domain in part e above:

13. Find the inverse function of $f(x) = 3x + 5$. Show **all** steps. (4 points)

$f^{-1}(x) =$ _____

14. Identify any x axis, y axis or origin symmetry in the relation $5x^2 - 2xy + y^2 = 0$. Show all appropriate steps. (5 points)

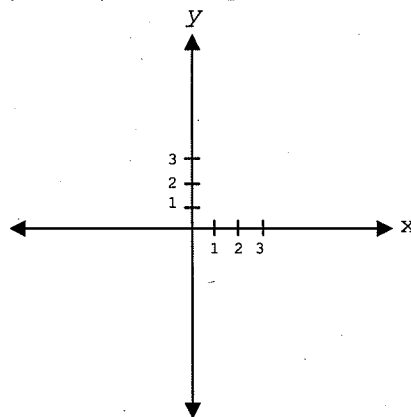
15. Sketch the graph of $4x^2 + y^2 = 16$, using x and y intercepts and results of symmetry tests. (6 points)

Identify:

x intercept(s): _____

y intercept(s): _____

Any x axis, y axis or origin symmetry:



16. In the blank to the left of each function listed in Column A, place the number of the graph in Column B that represents that function. Each item in Column B may be used once, more than once or not at all. (2 points each)

Column A

Column B

_____ a.) $y = f(x) = |x + 1|$

_____ b.) $y = f(x) = 2x^2 + 1$

_____ c.) $y = f(x) = -\sqrt{x-1}$

_____ d.) $y = f(x) = \frac{1}{x}$

_____ e.) $y = f(x) = 3x - 1$

