Name:_____

Part I. Multiple Choice. You will be given four points for each correct answer marked in the box below. Correct answers marked elsewhere will be given only three points each.

1	2	3	4	5	6	7	8	9	10
A	A	A	A	A	A	A	A	A	A
B	B	B	B	B	B	B	B	B	B
C	C	C	C	C	C	C	C	C	C
D	D	D	D	D	D	D	D	D	D
E	E	E	E	E	E	E	E	E	E

1. In which quadrant of the Cartesian plane is the point $(2, -1)$?
   (a) IV
   (b) III
   (c) II
   (d) I
   (e) None of these

2. Which operation tests an equation in x and y for symmetry with respect to the y-axis?
   (a) Replace each y with $(-y)$.
   (b) Replace each x with $(-x)$ and each y with $(-y)$
   (c) Replace each x with y.
   (d) Replace each x with $(-x)$.
   (e) None of these

3. On the sign chart of $\dfrac{(x-1)}{x+3}$ there is a change of signs at which numbers?
   (a) -3 and -1
   (b) 1 and -3
   (c) 1 and 3
   (d) -1 and 3
   (e) None of these

4. The distance between the points $(-2, 4)$ and $(1, 8)$ is
   (a) $\sqrt{17}$
   (b) $\sqrt{153}$
   (c) $\sqrt{145}$
   (d) 5
   (e) None of these

5. The equation of the circle with center (0,2) and radius 1 is
   (a) $x^2 + y^2 + 4y + 3 = 0$
   (b) $x^2 + y^2 = 4$
   (c) $x^2 + y^2 - 4y + 3 = 0$
   (d) $x^2 + 4y^2 = 1$
   (e) None of these

6. The coordinates of the midpoint of the line segment connecting the points $(-2, 4)$ and $(-4, 8)$ are
   (a) $(-3, 6)$
   (b) $(-3, 2)$
   (c) (1,6)
   (d) $(-1, 2)$
   (e) None of these

7. The slope of the line segment containing the points $(-2, 2)$ and $(-4, 8)$ is

   (a) $-\frac{5}{3}$

   (b) 3

   (c) -3

   (d) $-\frac{1}{3}$

   (e) None of these

8. The point-slope equation of a line is

   (a) $x = a$

   (b) $y - y_1 = m(x - x_1)$

   (c) $Ax + By = C$

   (d) $y = mx + b$

   (e) None of these

9. If $f(x) = \sqrt{x-4}$, then $f(x+1) =$

   (a) $\sqrt{x} - 1$

   (b) $\sqrt{x+1} - 2$

   (c) $\sqrt{x-3}$

   (d) $\sqrt{x-4} + 1$

   (e) None of these

10. Which of the following is not the equation of a function?

    (a) $y^2 = x$

    (b) $y = x^2$

    (c) $y = \sqrt{x}$

    (d) $y = 1 - x$

    (e) All of these are functions

Part II. *Show your work on the following problems.*

1. (a) Construct the sign chart for $\frac{x+1}{2-x}$.

   (b) ***Use the sign chart*** to solve the inequality $\frac{x+1}{2-x} \geq 0$. [State the solution using interval notation.]

2. Complete the square to find the *center* and *radius* of the circle with equation $x^2 + y^2 - 4x + 2y - 4 = 0$.

3. Apply all appropriate tests to determine the symmetry of the graph of $y^2 = x$

4. Find the slope-intercept equation of the line containing the point $(1, -2)$ and having slope 4.

5. Find the slope-intercept equation of the line containing the point (2,1) and parallel to the line $y = 3x + 2$.

6. Given the function $f(x) = x^2 - x$ find the following:

   (a) $f(2)$

   (b) $f(-1)$

   (c) $f(-x)$

   (d) $f(1 + t)$

Bonus (10 points): The endpoints of the diameter of a circle have coordinates (2,1) and (8,9). Find the equation of the circle.