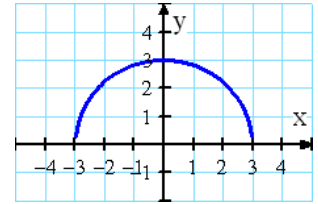
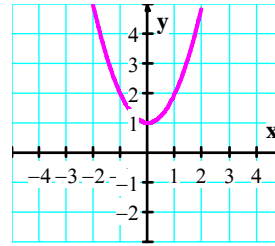
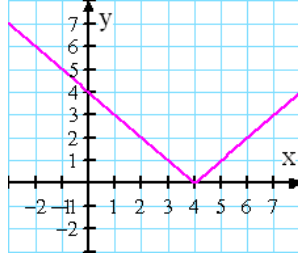
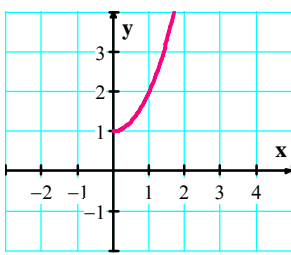


King Fahd University of Petroleum and Minerals
Prep-Year Math Program
Math (001)-Term (181)
Recitation (1.2)

Question 1: Plot the following graph:

(a): $x = \sqrt{y-1}$ (b): $y = |4-x|$ (c): $y = x^2 + 1$ (d): $y = \sqrt{9-x^2}$

Answer: (a): (b): (c): (d):



Question 2: Find the general form of the equation of a circle with center at $(-3, 5)$ and tangent to the y -axis.

Answer: $x^2 + 6x + y^2 - 10y + 25 = 0$

Question 3: If $x^2 + y^2 - 4y = 5 - k^2$ is the equation of a circle which is tangent to x -axis, then $k =$

(a): $\pm\sqrt{5}$ (b): 0 (c): ± 2 (d): ± 5 (e): ± 1

Answer: (a) $k = \pm\sqrt{5}$

Question 4: Find an equation of the circle that has the points $P(-1,1)$ and $Q(5,9)$ as the endpoints of a diameter.

Answer: $(x-2)^2 + (y-5)^2 = 25$

Question 5: Let \mathbf{M} be the midpoint of the line whose endpoints are $(1, -2)$ and $(-3, 6)$, and let \mathbf{C} be the center of the circle $x^2 + 4x + y^2 - 8y + 2 = 0$. Then, the distance between \mathbf{M} and \mathbf{C} is equal to

(a): $\sqrt{37}$ (b): $\sqrt{13}$ (c): $\sqrt{5}$ (d): $3\sqrt{5}$ (e): 9

Answer: (c) $\sqrt{5}$

Question 5: Discuss the symmetry of the following relations:

(a): $x^2 = |x - y|$

(b): $|xy| + |x|y = 1$

(c): $x^4y^4 + x^2y^2 = 1$

Solution:

(a): $x^2 = |x - y|$ **The graph is symmetric with the origin only:** Replace x with $-x$ and replace y with $-y$ to get $(-x)^2 = |-x - (-y)| \Rightarrow x^2 = |-x + y|$ which is identical to the original equation.

(b): $|xy| + |x|y = 1$ **The graph is symmetric with respect to the y-axis.** Replace x with $-x$ to get $|-xy| + |-x|y = 1 \Rightarrow |xy| + |x|y = 1$, which is identical to the original equation. It is.

(c): **The graph is symmetric with respect to the x-axis, y-axis and the origin.**

99. x-axis symmetry: $x^4(-y)^4 + x^2(-y)^2 = 1 \Leftrightarrow x^4y^4 + x^2y^2 = 1$, so the graph is symmetric with respect to the x-axis.

y-axis symmetry: $(-x)^4y^4 + (-x)^2y^2 = 1 \Leftrightarrow x^4y^4 + x^2y^2 = 1$, so the graph is symmetric with respect to the y-axis.

Origin symmetry: $(-x)^4(-y)^4 + (-x)^2(-y)^2 = 1 \Leftrightarrow x^4y^4 + x^2y^2 = 1$, so the graph is symmetric with respect to the origin.