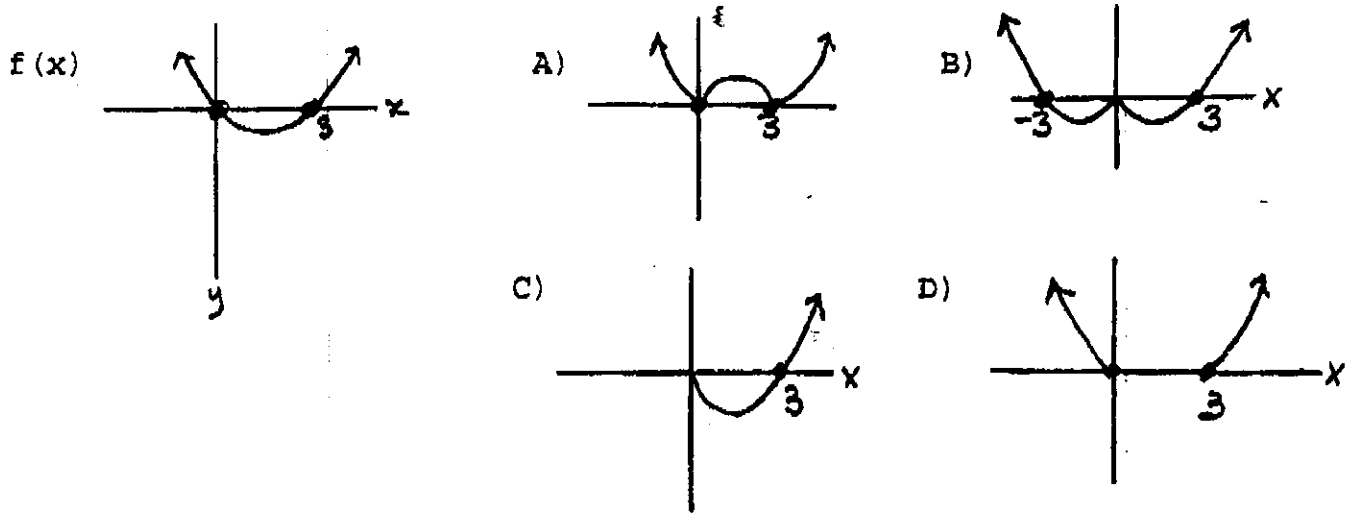
1. If the graph of the polynomial function $f(x)$ is shown, what is the grapho of the function $f(|x|)$?



2. Given the graph of $f(x)$ =, the graph of $f(x + 3)$ would be:

a. 3 units to the right of $f(x)$. b. 3 units to the left of $f(x)$.
c. 3 units above $f(x)$. d. 3 units below $f(x)$ e. not given

3. Which quadrants of the Cartesian plane contain the points of the graph of $x^2 + y^2 < 1$?

a. I & II only b. I & III only c. II & IV only d. III & IV only e. not given

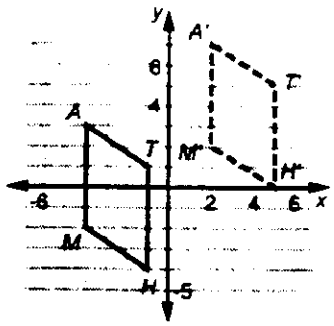
4. Let $f(x) = x^2 - x - 6$. Where does the graph of the function cross the x-axis?

a. (0,6) b. (0,-3), & (0, 2) c. (-3, 0) & (2, 0) d. (3, 0) & (-2, 0) e. not given

5. The graph of $|y| = x + 1$ is symmetric with respect to the
I. x - axis II. y -axis III. origin

a. I only b. II only c. III only d. I and II only e. not given

6. Refer to the graph, at the right. What translation maps MATH onto M'A'T'H'?



a. $T_{1,3}$ b. $T_{-6,-4}$ c. $T_{6,4}$ d. $T_{4,6}$
e. not given

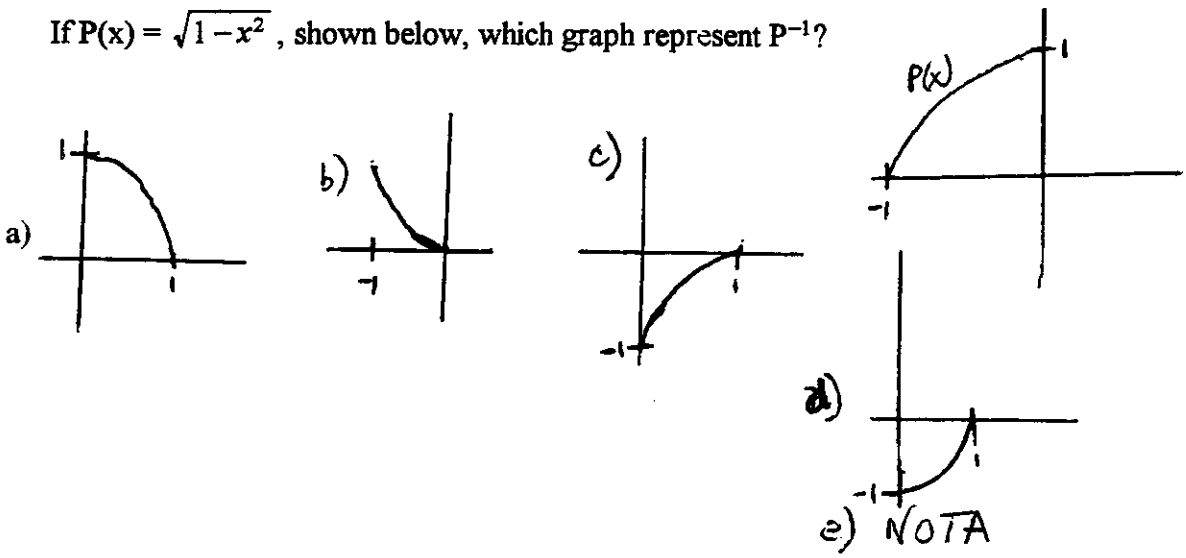
7. Which of the following graphs have vertical asymptotes at odd multiples of $\frac{\pi}{2}$?

a. $y = \tan x$ b. $y = \cot x$ c. $y = \sec x$ d. Both A and C
e. not given

8. Suppose the graph of a particular relation is symmetric with respect to the y-axis and the point (-2, 5) is on the graph. Which of the following is also a point on the graph?

a. (-2, -5) b. (2, -5) c. (2, 5) d. (5, -2) e. not given

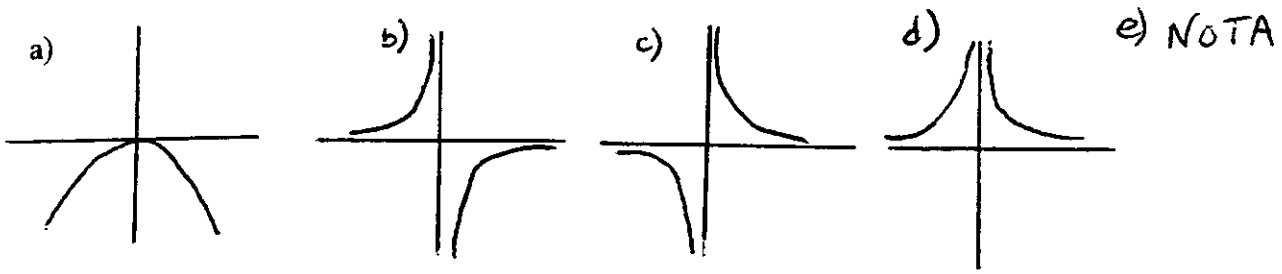
9. If $P(x) = \sqrt{1-x^2}$, shown below, which graph represent P^{-1}?



10. The graph of which of the following is a subset of a parabola?

a. $yx^2 = 1$ b. $|y| = x^2$ c. $y = \sqrt{x}$ d. $y = \sqrt{1+x^2}$ e. not given

11. Which of the following could be the graph of $f(x) = \frac{1}{x^2}$?



12. The following three transformations are applied (in the given order) to the graph of $y = x^2$:

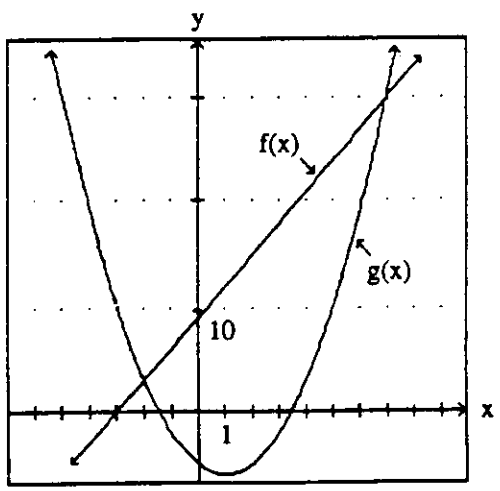
I. Vertical stretch by a factor of 2.
II. Horizontal shift left 3 units.
III. Vertical shift down 4 units.

Which of the following is an equation for the graph produced as a result of applying these transformations?

a. $y = 2(x-3)^2 + 4$ b. $y = 2(x+3)^2 + 4$ c. $y = 2(x-3)^2 - 4$
d. $y = 2(x+3)^2 - 4$ e. not given

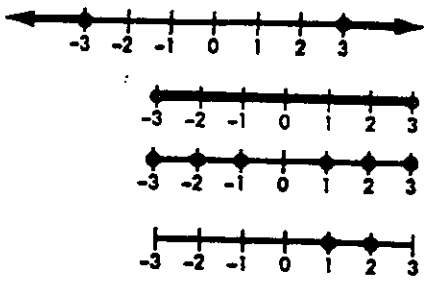
13. Use the graph to the right to solve $f(x) > g(x)$.

a. $x > 0$ b. $-2 < x < 7$
c. $x < -2$ or $x > 7$ d. $3 < x < 30$
e. not given



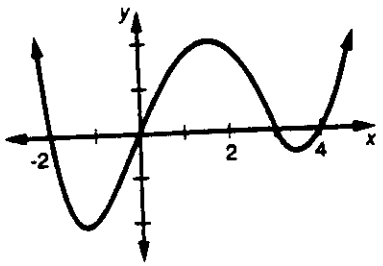
14. Which of the number lines shown below does not contain the correct graph of the solution set for the inequality or equation that appears at its left?

a. $x^2 \geq 9$ in the universe of real numbers.
b. $x^2 > 9$ in the universe of real numbers.
c. $x^2 \leq 9$ in the universe of non-zero integers.
d. $x^2 \leq 9$ in the universe of natural numbers.
e. not given



15. Which can be an equation for the polynomial graphed at the right?

a. $y = (x - 2)(x + 3)(x + 4)$
b. $y = x(x - 2)(x + 3)(x + 4)$
c. $y = (x + 2)(x - 3)(x - 4)$
d. $y = x(x + 2)(x - 3)(x - 4)$
e. not given



16. The graph of $f(x) = \frac{x^2-x-12}{x^2+x-6}$ has a "hole" in it. What are the cordinates (x,y) of the hole?

a. (2, 1.4) b. (2, -2) c. (-3, 0) d. (-3, 1.4) e. not given

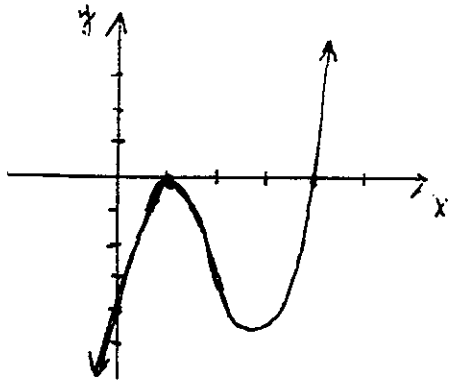
17. A graph of a parabola has line of symmetry x = -3 and contains the points (-5, 0) and (-3, -4). Determine an equation for the parabola.

a. $y = 2(x+3)^2 - 2$ b. $y = 2(x-3)^2 - 2$ c. $y = 2(x+3)^2 - 4$
d. $y = (x-3)^2 - 4$ e. not given

18. For how many real numbers x does $\log x = \sqrt{x}$?

a. 0 b. 1 c. 2 d. infinitely many e. not given

19. Which of the following can be the equation of the graph shown right?



a. $y = (x - 1)(x - 4)$ b. $y = (1 - x)(4 - x)$
c. $y = (1 - x)^2(x - 4)$ d. $y = (1 - x)(4 - x)^2$
e. not givne

20. The graph of $|y| = |x|$ is

a. a circle b. a hpperbola c. a line d. a single point e. not given

21. The graph of $x = 3 \cos t$ and $y = 2 \sin t$ is a

a. circle b. parabola c. ellipse d. straight line e. not given

22. The graph of the natural exponential function, $y = e^x$, and the function $y = e^{-x}$ are reflections of one another over what line?

a. $y = x$ b. $y = 0$ c. $x = 0$ d. $y = -x$ e. not given

23. The function f is a polynomial function of odd degree. Which statement must be true of the graph of f?

a. The graph crosses the positive x-axis at least once.
b. The graph crosses the x-axis at least once.
c. The graph is symmetrical with the origin.
d. The graph has five real roots.
e. not given

24. The graph of $y = | | x - 3 | - 4 |$ has what general shape?

a. a W b. a series of segments c. a V d. a line e. not given

25. An equation of the sine wave translated on a graph horizontally 4 units and vertically 3 units with a period of π, would have the following equation?

a. $y = 4 + 3 \sin x$ b. $y = 3 + \sin 2(x - 4)$ c. $y = 3 + \sin (x - 4)$
d. $y = 3 + \sin (2x - 4)$ e. not given

26. Find the equation of the axis of symmetry of $x = y^2 - 6y + 14$.

a. $x = 3$ b. $x = -3$ c. $y = 14$ d. $y = -3$ e. not given

27. The graph of $| y - 1 | = | x + 1 |$ forms an x. Find the coordinate of the point of intersection of the two branches of the x.

a. (0, 0) b. (1, 1) c. (-1, 1) d. (1,-1) e. not given

28. If a graph were constructed showing hours of daylight as a function of day of the year for Chattanooga, Tennessee, what type function would model the data best?

a. trigonometric function b. constant function c. linear function
d. exponential function e. not given

29. Start at the origin of the Cartesian coordinate system. Move right one unit. Turn 90° counterclockwise (ccw), and move two units. At each corner, turn 90° ccw, and proceed one unit more than you moved in getting to the previous point. After 1995 moves from the origin, with the point (1, 0) ending the first move, what is the y-coordinate of the point at which you stop?

a. 995 b. 996 c. 997 d. 998 e. not given

30. The graph of $(x^2-1)y=x^2-4$ has

a. 1 horizontal and 1 vertical asymptotes
b. 2 vertical but no horizontal asymptotes
c. 1 horizontal and 2 vertical asymptotes
d. 2 horizontal and 2 vertical asymptotes
e. not given