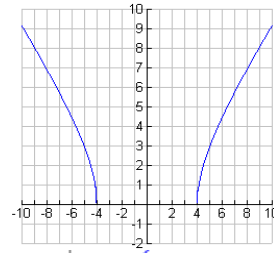


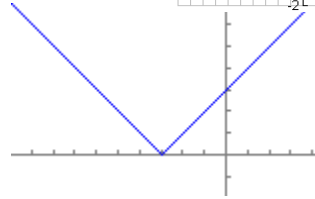
Sample Questions to the Final Exam in Math 1111—Chapter 2

Section 2.1: Basics of Functions and Their Graphs

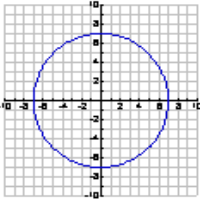
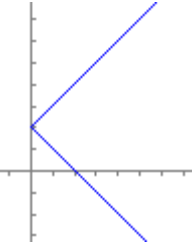
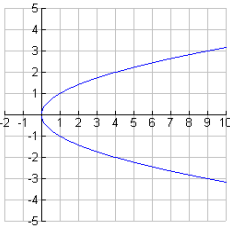
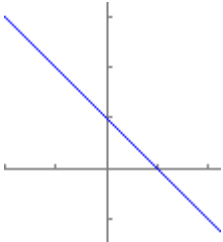
1. Find the range of the function: $y = \sqrt{x^2 - 16}$.
 a. $[-4, 4]$ b. $(-\infty, -4], [4, \infty)$ c. $[0, \infty)$ d. $(-\infty, \infty)$ e. None of these



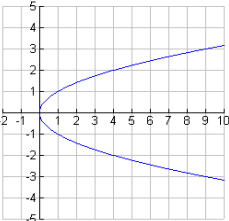
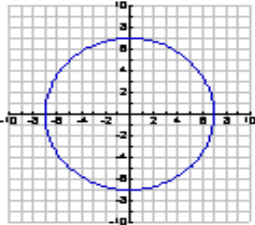
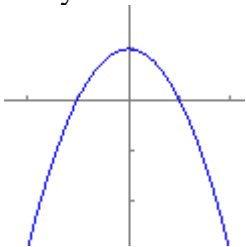
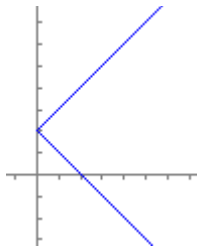
2. Find the domain of the function: $f(x) = |3 + x|$.
 a. $(-\infty, 3]$ b. $(-\infty, \infty)$ c. $[3, \infty)$ d. $[-3, \infty)$ e. None of these



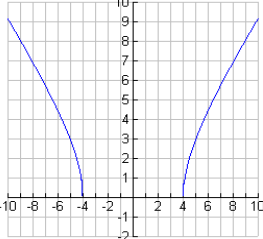
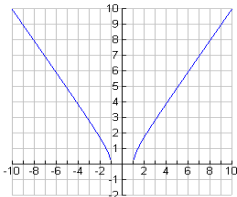
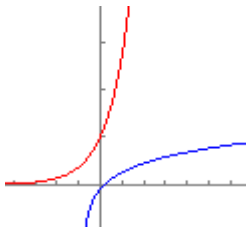
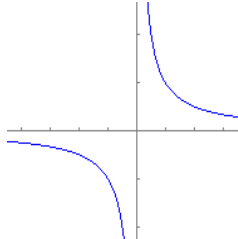
3. Use the vertical line test to determine in which case y is a function of x .

a. 
 b. 
 c. 
 d. 
 e. None of these

4. Use the vertical line test to determine in which case y is a function of x .

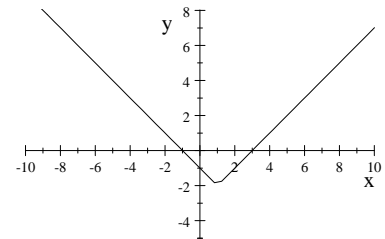
a. 
 b. 
 c. 
 d. 
 e. None of these

5. Which of the following is NOT a function?

a. 
 b. 
 c. 
 d. 
 e. None of these

6. The graph of a function $y = f(x)$ is indicated. Find all values of x for which $f(x) = 0$.

- a. -1 b. 0 c. $-1, 0$ d. $-1, 3$ e. $0, 3$

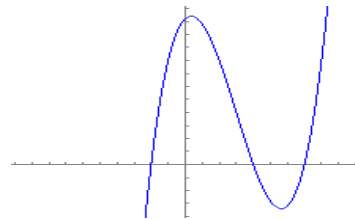


7. Find the range of $g(x) = \frac{|x-1|}{x-1}$.
 a. $\{-1, 1\}$ b. $(-\infty, 1) \cup (1, \infty)$ c. $(-\infty, -1) \cup (1, \infty)$ d. $(-\infty, \infty)$ e. None of these

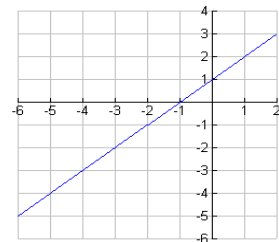
8. Determine which equation represents y as a function of x .
 a. $x^2 + y^2 = 4$ b. $(x-2)^2 + y^2 = 4$ c. $x^2 + y = 4$ d. $x = y^2$ e. None of these
9. Find the domain of $f(x) = 1 - x^2$.
 a. $(-\infty, \infty)$ b. $(-\infty, -2] \cup [2, \infty)$ c. $(-3, 3)$ d. $(-\infty, 1)$ e. None of these
10. Given $f(x) = 2x^3 - x^2 + 5x - 8$, find $f(-2)$.
 a. -30 b. -38 c. -36 d. -34 e. None of these
11. Given $g(x) = 2x^2 - 1$, find $g(a-1)$.
 a. $2a^2 - 2$ b. $2a^2 - 3$ c. $2(a-1)^2 - 1$ d. $(2a-2)^2 - 1$ e. None of these
12. Given $g(x) = 5 - (x-1)^2$, find $g(x+1) - g(x)$.
 a. 1 b. $-2x+1$ c. $-2x^2 - 4x + 1$ d. $2x-1$ e. None of these
13. Given $f(x) = \frac{x}{1-x}$, find $f\left(\frac{1}{a}\right)$.
 a. $\frac{a}{1-a}$ b. $\frac{1}{a-1}$ c. $\frac{a}{a-1}$ d. $\frac{1}{1-a}$ e. None of these

Section 2.2: Functions

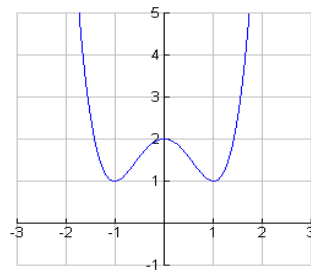
1. Use the graph below to give the zeros of the function.
 a. 2, -4, -7 b. -2, 0, 4, 7 c. 11 d. -2, 4, 7 e. None of these



2. The graph of a function $y = f(x)$ is indicated. Find the value of $f(-4)$.
 a. 0 b. -1 c. -3 d. -5 e. 1



3. Give the intervals on which the function is increasing.
 a. $(-1, 1)$ b. $(-1, 0) \cup (1, \infty)$ c. $(-\infty, \infty)$ d. $(-\infty, -1) \cup (1, \infty)$ e. $(0, 1)$



4. Give the relative maximum value of the function $f(x) = -0.04x^2 + .26x + .14$.
 a. 3.25 b. 0.5625 c. 0.14 d. 6.5 e. None of these

5. Given $f(x) = \begin{cases} 2x^3 & \text{if } x \leq 2 \\ x+4 & \text{if } x > 2 \end{cases}$, find $f(-2)$.
 a. 16 b. 2 c. -16 d. -2 e. None of these

6. Determine whether the function $f(x) = 7x^3 - x$ is even, odd, or neither.
 a. even b. odd c. neither

Sections 2.3 and 2.4 : Linear Functions and Slope

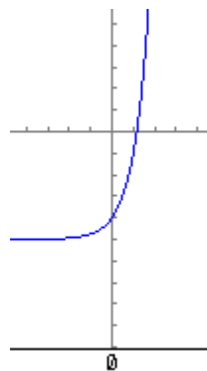
- Find the slope of the line containing (3,5) and (4,-2).
a. -7 b. $-\frac{1}{7}$ c. $\frac{7}{3}$ d. $\frac{3}{7}$ e. None of these
- Find the x-intercepts of the line containing (1,10) and (-5,-2).
a. (0,-4) b. (0,8) c. (-4,0) d. (-5,-2) e. None of these
- Find the slope of the line which is perpendicular to the line $3x-2y = -4$.
a. $-\frac{3}{2}$ b. $\frac{3}{2}$ c. $-\frac{2}{3}$ d. $\frac{3}{4}$ e. None of these
- If the line $y = mx + b$ is parallel to the line $3x + 4y = 2$, find m.
a. $-\frac{4}{3}$ b. $-\frac{3}{4}$ c. $-\frac{1}{2}$ d. $\frac{3}{4}$ e. None of these
- Which of the following represents a horizontal line?
a. $y-3=0$ b. $x-y=0$ c. $x=0$ d. $x-3=0$ e. None of these
- Which of the following has a negative y-intercept?
a. $2x-y=0$ b. $2x-y=-3$ c. $2x-y=3$ d. $2x+y=0$ e. None of these
- The equation of the line containing (-2,1) and (-2,-1) is
a. $y+1=0$ b. $y-1=0$ c. $x+2y=0$ d. $x-2=0$ e. None of these
- Find the equation of the line with x-intercept -4 and y-intercept 3.
a. $3x-4y=-12$ b. $4x+3y=12$ c. $4x-3y=12$ d. $3x-4y=12$ e. None of these
- Find the equation of the line containing the origin and perpendicular to the line $6x+8y=3$.
a. $3x+4y=0$ b. $4x-3y=0$ c. $3x-4y=0$ d. $2x-1=0$ e. None of these
- Find the equation of the line passing through (2,-3) and parallel to the line $3x+4y=5$.
a. $4x+3y=-1$ b. $4x-3y=15$ c. $3x-4y=18$ d. $3x+4y=-6$ e. None of these
- Find the equation of the line with slope 3 and x-intercept -5.
a. $3x-y=5$ b. $3x-y=-15$ c. $x+3y=-5$ d. $x-3y=-5$ e. None of these
- Find the equation of the line passing through (0,4) which is perpendicular to the line $x-3y=7$.
a. $3x+y=4$ b. $x-3y=-12$ c. $3x-y=-4$ d. $3x-y=4$ e. None of these

Section 2.5 : Transformations of Functions

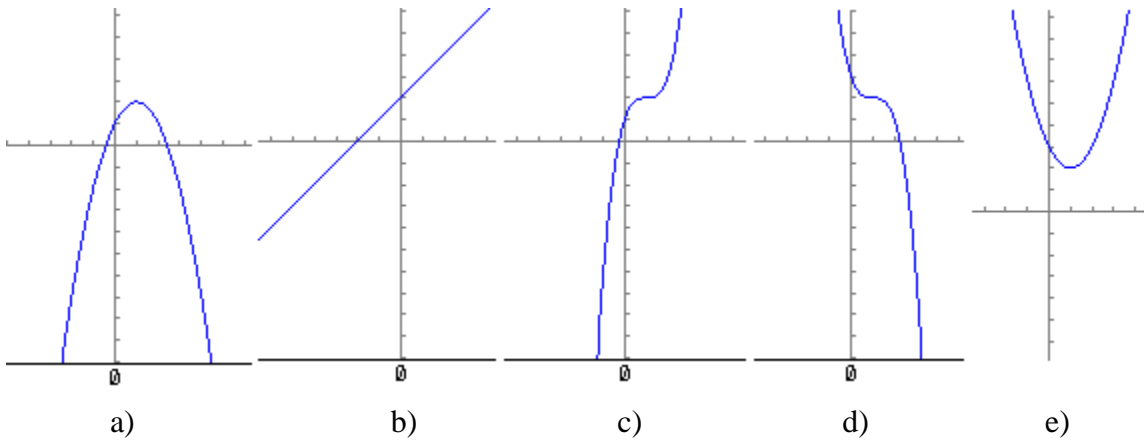
- If the graph of $f(x) = x^2$ is shifted and the new vertex is (2,-3), find the transformed function.
a. $f(x)=(x-2)^2-3$ b. $f(x)=(x+2)^2-3$ c. $f(x)=(x+2)^2+3$ d. $f(x)=(x-2)^2+3$ e. None of these

- Match the graph with the correct function.

- (a) $f(x) = 4^x - 5$ (b) $f(x) = 4^x + 5$
(c) $f(x) = 4^{-x} + 5$ (d) $f(x) = 4^{-x} - 5$



- Which of the following could be the graph of $y = -(x-1)^2 + 2$?



4. The graph of $y = |x|$ is shifted 5 units to the left, reflected over the x -axis, stretched vertically by a factor of 3, and shifted down 7. Give the equation of the resulting function.
 a. $y = -3|x+5|-7$ b. $y = -3|x-5|-7$ c. $y = 3|x+5|-7$ d. $y = 3|x+5|+7$ e. None of these
5. The graph of a function resembles the graph of $y = x^3$, but has been shifted up 2 units and passes through the point $(1,5)$. Which of the following could be the equation for the graph?
 a. $y = x^3 + 2$ b. $y = 3x^3 + 2$ c. $y = 2x^3 + 3$ d. $y = 3x^3 - 2$ e. None of these

Section 2.6 : Combinations of Functions

1. Give the domain of the function $f(x) = \frac{x+4}{3x^2-14x-5}$.
 a. $x \neq -4$ b. $x \neq -5$ or $\frac{1}{3}$ c. $\{x \mid x \text{ is a real number}\}$ d. $x \neq -\frac{1}{3}$ or 5 e. None of these
2. Give the domain of the function $f(x) = 2x^3 + 3x - 4$.
 a. $\{x \mid x \text{ is a real number}\}$ b. $x \neq 0$ c. $x \neq -4$ d. $x \neq 2$ e. None of these
3. Give the domain of the function $f(x) = \sqrt{7x+5}$.
 a. $x \geq 0$ b. $x \neq -\frac{5}{7}$ c. $x \leq -\frac{5}{7}$ d. $x \geq -\frac{5}{7}$ e. None of these
4. If $f(x) = \frac{1}{3}x - 3$, find $(f \circ f)(x)$.
 a. $\frac{1}{6}x - 4$ b. $\frac{2}{3}x - 6$ c. $\frac{1}{9}x - 4$ d. $\frac{1}{9}x^2 - 2x + 9$ e. None of these
5. Given $f(x) = 2x - 4$ and $g(x) = 1 + 3x$, find $(f + g)(x)$.
 a. $5x - 3$ b. $x - 3$ c. $-(x + 3)$ d. 0 e. None of these
6. Given $f(x) = 6$ and $g(x) = 2x^2 - 1$, find $(f - g)(x)$.
 a. $2x^2 + 5$ b. $2x^2 - 7$ c. $-2x^2 + 7$ d. $-2x^2 + 5$ e. None of these
7. Given $f(x) = 2x$ and $g(x) = x - 1$, find $(fg)(x)$.
 a. $x + 1$ b. $2x^2 - 2x$ c. $3x - 1$ d. $2x^2 - 1$ e. None of these
8. Given $f(x) = x$ and $g(x) = 3x - 1$, find $\left(\frac{f}{g}\right)(x)$.

a. $3x^2 - x$ b. $\frac{3x-1}{x}$ c. $\frac{x}{3x-1}$ d. $4x-1$ e. None of these

9. Given $f(x) = x^2$ and $g(x) = x+5$, find $(g \circ f)(x)$.

a. $(x+5)^2$ b. x^2+5 c. x^2+25 d. x^2+5x^2 e. None of these

10. Given $f(x) = x^2 - 2x$ and $g(x) = 2x+3$, find $(f \circ g)(x)$.

a. $4x^2+8x+3$ b. $2x^2-4x+3$ c. $2x^3-x^2-6x$ d. $3x^2+x$ e. None of these

Section 2.7: Inverse Functions

1. Find the inverse function of $g(x) = \sqrt[3]{\frac{x+1}{2}}$.

a. $g^{-1}(x) = \frac{x^3+1}{8}$ b. $g^{-1}(x) = \sqrt[3]{\frac{y+1}{2}}$ c. $g^{-1}(x) = 2x^3-1$ d. $g^{-1}(x) = 8x^3-1$ e. None of these

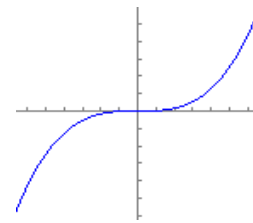
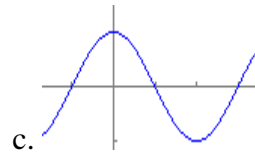
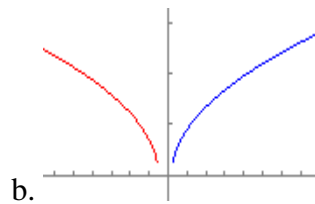
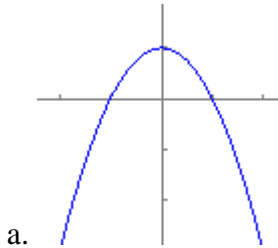
2. If $f(x) = 3x$, which of the following is a point on $f^{-1}(x)$?

a. $(-2,6)$ b. $(6,2)$ c. $(6,-2)$ d. $(2,-6)$ e. None of these

3. Find the inverse function of $f(x) = \frac{1}{2}x^2$; $x \geq 0$.

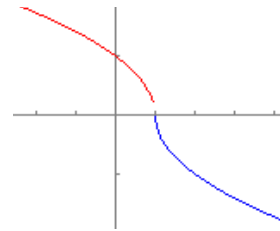
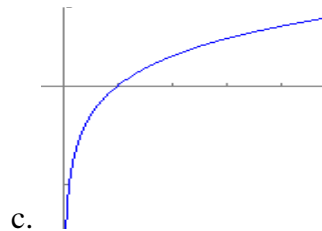
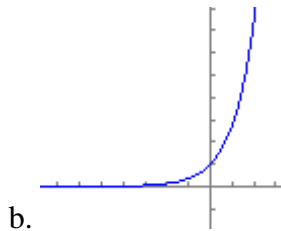
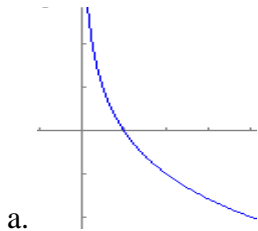
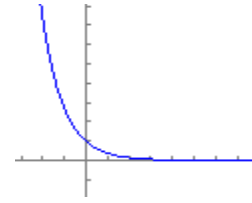
a. $f^{-1}(x) = \sqrt{2x}$ b. $f^{-1}(x) = 2\sqrt{x}$ c. $f^{-1}(x) = 2x$ d. $f^{-1}(x) = \frac{x}{2}$ e. None of these

4. Which of the following has an inverse function?



e. None of these

5. Find the inverse of the function shown on graph. \longrightarrow



e. None of these

Section 2.8: Equation of a circle and Distance and Midpoint Equations

1. Find the distance between the points: $(-2, 1)$ and $(3, 4)$.

- a. 2.16 b. 3.83 c. 4.18 d. 5.83 e. None of these

2. Find the midpoint point: $(-5, -3)$ and $(9, 3)$.

- a. $(2, 0)$ b. $(-5, 9)$ c. $(-3, 3)$ d. $(-8, 12)$ e. None of these

3. Determine the equation of the circle in standard form with radius 2 and center $(-1, 3)$.

- a. $(x-1)^2 + (y-3)^2 = 2$ b. $(x-1)^2 + (y-3)^2 = 4$ c. $(x+1)^2 + (y-3)^2 = 2$ d. $(x+1)^2 + (y-3)^2 = 4$ e. None of these

4. Find the center and radius of the circle: $(x-2)^2 + (y+4)^2 = 25$.

- a. Center: $(2, -4); r = 5$ b. Center: $(-2, 4); r = 5$ c. Center: $(2, -4); r = 25$ d. Center: $(-2, 4); r = 25$ e. None of these