

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

Section 2.1: Lines in the Plane 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 2.2: Functions

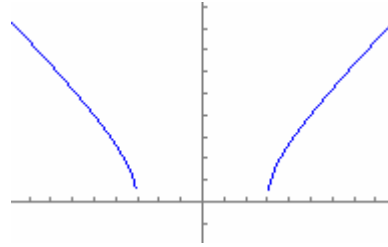
- Given $f(x) = 2x^3 - x^2 + 5x - 8$, find $f(-2)$.
a. -30 b. -38 c. -36 d. -34 e. None of these
- Given $g(x) = 2x^2 - 1$, find $g(a-1)$.
a. $2a^2 - 2$ b. $2a^2 - 3$ c. $2(a-1)^2 - 1$ d. $(2a-2)^2 - 1$ e. None of these
- Given $g(x) = 5 - (x-1)^2$, find $g(x+1) - g(x)$.
a. 1 b. $-2x+1$ c. $-2x^2 - 4x+1$ d. $2x-1$ e. None of these
- 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
- 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
- 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

7. 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

Section 2.3: Analyzing Graphs of Functions

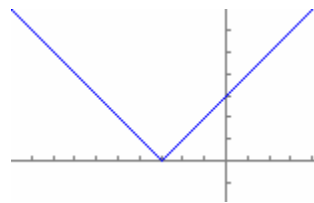
1. Find the range of the function: $y = \sqrt{x^2 - 9}$.



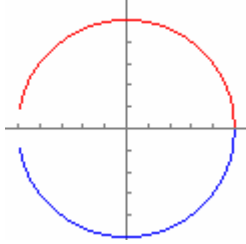
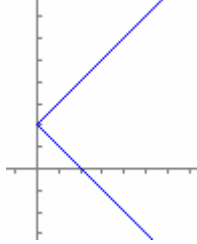
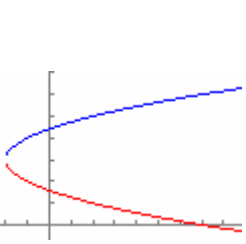
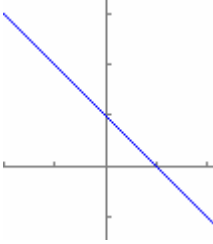
- a. $[-3, 3]$ b. $[-\infty, -3], [3, \infty)$ c. $[0, \infty)$ d. $(-\infty, \infty)$ e. None of these

2. Find the domain of the function: $f(x) = |3 + x|$.

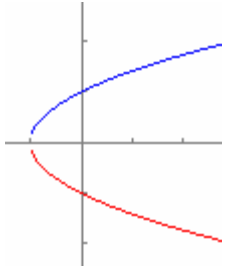
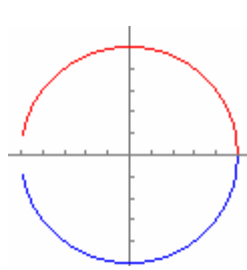
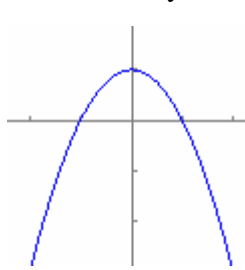
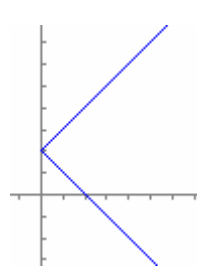
- a. $(-\infty, 3]$ b. $(-\infty, \infty)$ c. $[3, \infty)$ d. $[-3, \infty)$ e. None of these




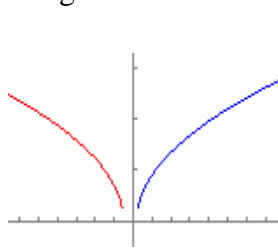
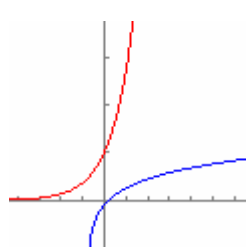
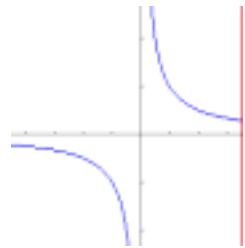
3. Use the vertical line test to determine in which case y is a function of x .

- 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

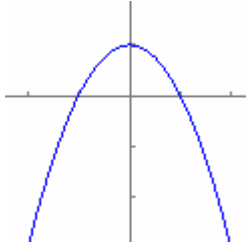
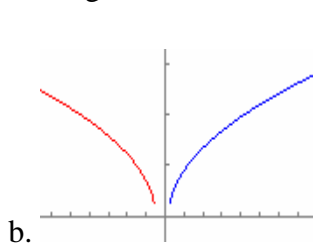
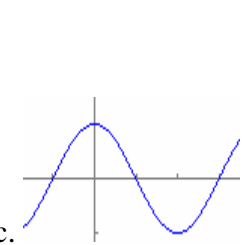
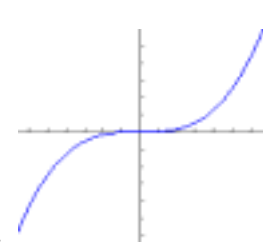
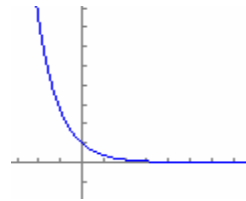
Section 2.5 and 2.6 : Translations and Combinations of Functions

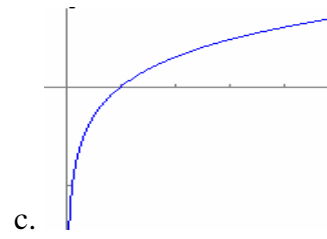
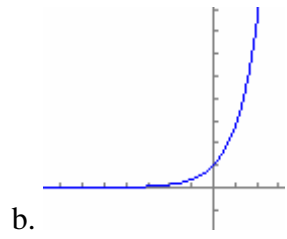
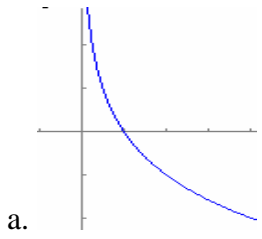
1. If the graph of $f(x) = x^2$ is shifted and the new vertex is $(2, -3)$, find the transformed function.

- 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

2. 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
3. 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
4. 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
5. 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
6. 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
7. 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
8. 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?
- a.  b.  c.  d.  e. None of these
5. Find the inverse of the function shown on graph. 



e. None of these