

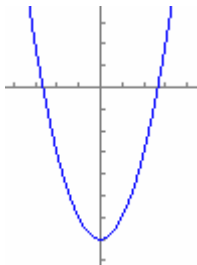
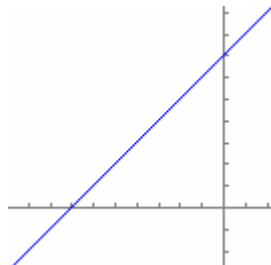
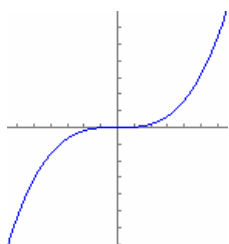
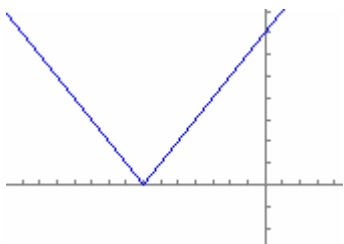
## Sample Questions to the Final Exam in Math 1111—Chapter 1

### Section 1.1

1. Determine which of the following points does not lie on the graph of  $y = \frac{1}{x^2 + 1}$ .

- a.  $(-1, \frac{1}{2})$     b.  $(-2, -\frac{1}{3})$     c.  $(3, \frac{1}{10})$     d.  $(6, \frac{1}{37})$     e. All lie on the graph

2. Identify the graph of the equation  $y = |x + 7|$ .

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

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

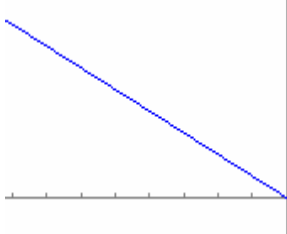
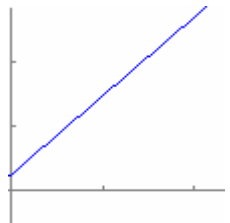

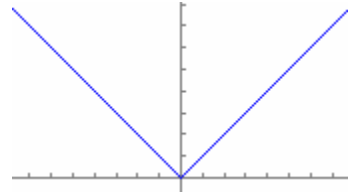
- a.  $(x-1)^2 + (y-3)^2 = 2$     b.  $(x-1)^2 + (y-3)^2 = 4$     c.  $(x+1)^2 + (y-3)^2 = 2$     d.  $(x+1)^2 + (y-3)^2 = 4$     e. None of these

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

### Section 1.2

1. The earnings per share for a certain corporation from 1985 to 1990 can be approximated by the mathematical model  $y = 1.23t + 0.25$  where  $y$  is the earnings and  $t$  represents the calendar year with  $t = 0$  corresponding to the year 1985. Identify the graph of this equation.

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

2. Solve for  $x$ :  $2 - 6 + 3x = 3x + 7$

- a.  $x = -\frac{11}{6}$     b.  $x = \frac{11}{6}$     c.  $x = \frac{1}{6}$     d. No solution    e. None of these

3. Solve for  $x$ :  $\frac{7x}{x-2} + \frac{2x}{x+2} = 9$

- a.  $-\frac{18}{5}$     b.  $\frac{2}{3}$     c.  $-\frac{2}{5}$     d.  $\frac{5}{18}$     e. None of these

### Section 1.3

1. The handicap,  $H$ , for a bowler with an average score,  $A$ , of less than 200 is determined using the formula  $H = 0.8(200 - A)$ . Find a bowler's average score if his handicap is 64.

- a. 110    b. 120    c. 130    d. 140    e. None of these

2. A telephone call costs \$0.31 for the first minute plus \$0.24 for each additional minute. Write an algebraic expression for the cost of a call lasting  $x$  minutes.  
 a.  $0.31+0.24x$     b.  $0.24x$     c.  $0.31+0.24(x-1)$     d.  $0.31+0.24(x+1)$     e. None of these
3. Maria inherited \$15,000. She decided to invest it in two funds, one paying  $9\frac{1}{4}\%$  simple interest, the other paying  $11\frac{1}{2}\%$  simple interest. Her annual income from these investments will total \$1623.75. How much did she invest in the fund that pays  $9\frac{1}{4}\%$  simple interest?  
 a. \$4500    b. \$10,500    c. \$488    d. \$14,512    e. None of these
4. Two friends living 216 miles apart in bordering states are planning to meet at the state line. The speed limit in one state is 55 mph and 65 mph in the other. Assuming each will drive the speed limit and each will travel the same length of time, determine how far from the state line the person who is traveling at 65 mph lives.  
 a. 99 miles    b. 117 miles    c. 108 miles    d. 180 miles    e. None of these
5. You want to measure the height of a tree. To do this, you measure the tree's shadow and find that it is 52.5 feet long. You also measure the shadow of a 4 foot stake and find that its shadow is 6 feet long. How tall is the tree?  
 a. 35 ft    b.  $78\frac{3}{4}$  ft    c. 42 ft    d.  $60\frac{1}{3}$  ft    e. None of these

### Section 1.4

1. Solve for  $x$ :  $2x^2 + 4x = 9x + 18$   
 a.  $-2, \frac{9}{2}$     b.  $2, -\frac{9}{2}$     c.  $\frac{9}{2}$     d.  $-\frac{9}{2}$     e. None of these
2. Solve for  $x$ :  $(2x+3)^2 = 4$   
 a.  $\frac{1}{2}, \frac{5}{2}$     b.  $-\frac{1}{2}$     c.  $-\frac{5}{2}, -\frac{1}{2}$     d.  $\pm 2$     e. None of these
3. Solve for  $x$ :  $x^2 + 4x - 2 = 0$   
 a.  $2 \pm \sqrt{6}$     b.  $2 \pm \sqrt{2}$     c.  $-2 \pm \sqrt{2}$     d.  $-2 \pm \sqrt{6}$     e. None of these
4. Solve for  $x$ :  $3x^2 - 6x + 2 = 0$   
 a.  $\frac{3 \pm \sqrt{3}}{3}$     b.  $1 \pm \sqrt{3}$     c.  $\frac{3 \pm \sqrt{15}}{3}$     d.  $\frac{1}{3}, 2$     e. None of these
5. Two airplanes leave simultaneously from the same airport, one flying due east, and the other flying due north. The eastbound plane is flying 50 miles per hour slower than the northbound one. If after 4 hours they are 1000 miles apart, how fast is the northbound plane traveling?  
 a. 150 mph    b. 200 mph    c. 100 mph    d. 300 mph    e. None of these

### Section 1.5

1. Simplify then write your result in standard complex number form:  $(3+6i) - 2(i+7) - \sqrt{-4}$   
 a.  $1+4i$     b.  $-11+6i$     c.  $-11+2i$     d.  $3+4i$     e. None of these
2. Multiply:  $(3-\sqrt{-4})(7+\sqrt{-9})$   
 a.  $15+23i$     b.  $27-5i$     c.  $27+5i$     d.  $15+5i$     e. None of these
3. Divide then write the result in standard complex number form:  $\frac{-4+i}{1+4i}$   
 a.  $-\frac{8}{17}+i$     b.  $-i$     c.  $i$     d.  $\frac{8}{17}-i$     e. None of these
4. Solve for  $x$ :  $x^2 - 2x + 10 = 0$   
 a.  $7, -1$     b.  $1+3i, -1+3i$     c.  $1+3i, 1-3i$     d.  $4, -2$     e. None of these

### Section 1.6

1. Solve:  $x^3 - 5x - 2x^2 + 10 = 0$

a.  $-2, \pm\sqrt{5}$    b.  $\pm\sqrt{5}$    c.  $2, \sqrt{5}$    d.  $2, \pm\sqrt{5}$    e. None of these

2. Solve for x:  $9x^4 - 24x^2 + 16 = 0$

a.  $\pm\frac{2\sqrt{3}}{3}$    b.  $\frac{2\sqrt{3}}{3}$    c.  $0, \pm\frac{2\sqrt{3}}{3}$    d.  $\frac{4}{3}$    e. None of these

3. Solve for x:  $3x - 2\sqrt{x} - 5 = 0$

a.  $\frac{5}{3}$    b.  $-1, \frac{5}{3}$    c.  $1, \frac{25}{9}$    d.  $\frac{25}{9}$    e. None of these

4. Solve for x:  $(x^2 - 2x + 5)^{\frac{2}{3}} = 4$

a.  $-3, 1$    b.  $-1 \pm \sqrt{13}$    c.  $-1, 3$    d.  $1$    e. None of these

5. Solve for x:  $\frac{2}{x^2 - 1} + \frac{1}{x + 1} = 5$

a.  $\frac{6}{5}$    b.  $-1, \frac{6}{5}$    c.  $\frac{1 \pm \sqrt{41}}{10}$    d.  $\pm\frac{\sqrt{2}}{2}$    e. None of these

### Section 1.7

1. Solve the equality:  $|x^2 - 2x| = 3x - 6$

a.  $2$    b.  $2, \pm 3$    c.  $2, 3$    d.  $\pm 3$    e. None of these

2. Solve the inequality:  $-16 \leq 7 - 2x \leq 5$

a.  $x \leq 1$  or  $x \geq \frac{23}{2}$    b.  $-1 \leq x \leq \frac{23}{2}$    c.  $1 \leq x \leq \frac{23}{2}$    d.  $-\frac{23}{2} \leq x \leq 1$    e. None of these

3. Solve the inequality:  $|3x - 1| < 2$

a.  $(-\infty, -\frac{1}{3}) \cup (1, \infty)$    b.  $[-\frac{1}{3}, 1]$    c.  $(-\frac{1}{3}, 1)$    d.  $(-\infty, -\frac{1}{3}] \cup [1, \infty)$    e. None of these

4. You buy a bag of candy that costs \$2.90 per pound. The weight that is listed on the bag is 1.10 pounds. If the scale that weighed the candy is only accurate to within 0.125 of a pound, how much money might you have been overcharged or undercharged?

a.  $22 \frac{1}{8}$  cents   b.  $17 \frac{3}{4}$  cents   c.  $36 \frac{1}{4}$  cents   d.  $31 \frac{1}{2}$  cents   e. None of these

### Section 1.8

1. Solve the inequality:  $2x^2 - 5x > 3$

a.  $(-\frac{1}{2}, 3)$    b.  $(-\infty, -\frac{1}{2}) \cup (3, \infty)$    c.  $(-\infty, -3) \cup (\frac{1}{2}, \infty)$    d.  $(-\frac{1}{2}, \infty)$    e. None of these

2. Solve the inequality:  $\frac{x+16}{3x+2} \leq 5$

a.  $(-\infty, -\frac{2}{3}] \cup [\frac{3}{7}, \infty)$    b.  $[-\frac{2}{3}, \frac{3}{7}]$    c.  $(-\infty, -\frac{2}{3}) \cup [\frac{3}{7}, \infty)$    d.  $(-\frac{2}{3}, \frac{3}{7}]$    e. None of these