

In problems (1-4) solve for x. ( 8 points each)

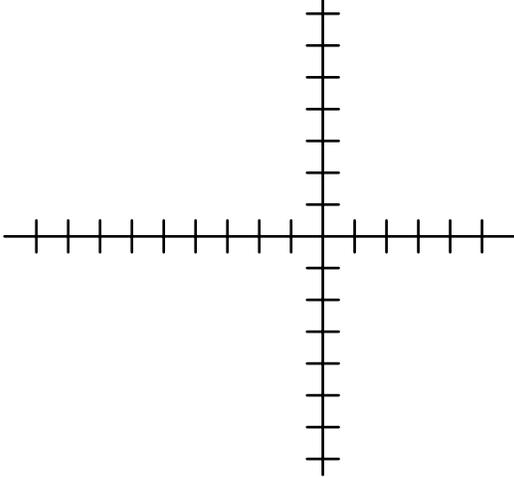
1.)  $2x^2 - x - 6 = 0$

2.)  $(x + 2)(x - 5) = 10$

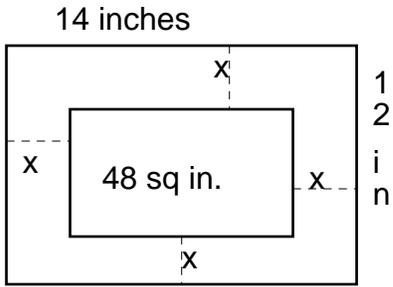
3.)  $x^2 + 3x = -2$

4.)  $2(x + 5)^2 = 8$

- 5.) Find the coordinates of the vertex, x-intercepts and y-intercept of  $y = 3x^2 + 6x$  .  
Draw a rough sketch labeling the points named. (10 points)



6. Write an equation of a parabola whose y-intercept is  $(0, 2)$ . (3 points)
7. Write an equation of a parabola which has x-intercepts  $(-3, 0)$  and  $(2, 0)$  . (4 points)
8. The outside measurements of a picture frame are 12 inches by 14 inches. The frame has the same width all the way around. The area of the picture is 48 square inches. What is the width of the frame? (8 points)



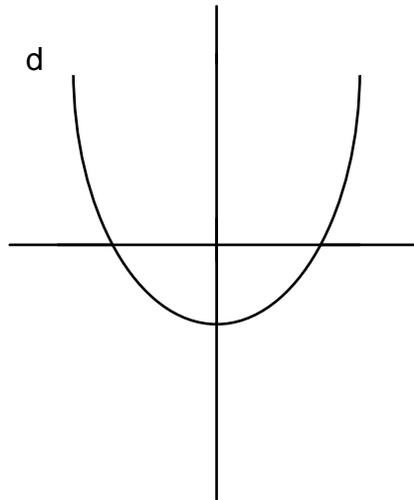
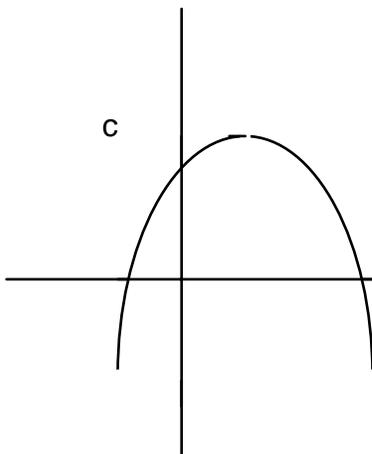
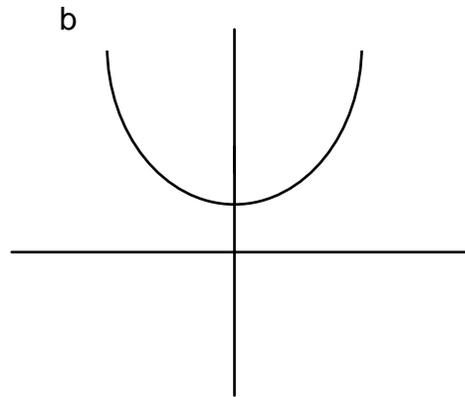
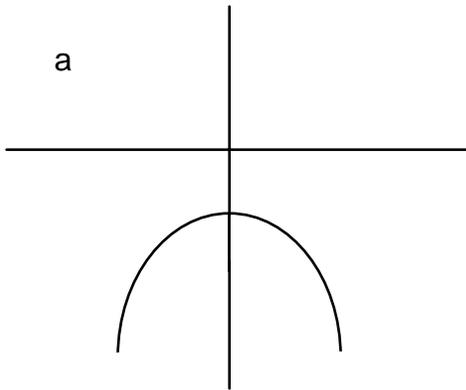
9.) Match the following equations to the graphs below. Assume the scale on each graph is the same. (20 pts.)

\_\_\_\_\_ (i)  $y = 3x^2 + 2$

(ii)  $y = -3x^2 + 5x + 2$  \_\_\_\_\_

\_\_\_\_\_ (iii)  $y = 3x^2 - 2$

(iv)  $y = -3x^2 - 2$  \_\_\_\_\_



10. Buck drove 40 miles to work. It took him 20 minutes more to return home than it did going to work, because he drove 10 m.p.h. faster on the way to work. How fast did he drive each way? (8 points)

11. C3PO has installed an ejection seat in his land rover for quick escapes. R2D2 is sky high after accidentally bumping the ejection switch. The seat throws R2 upward as described by  $y = 4 + 100x - 16x^2$  where  $x$  is the number of seconds after the ejection button is hit and  $y$  is the number of feet above the ground after  $x$  seconds. (15 points)

a.) How long before R2 is 88 feet above the ground?

b.) How high is R2 after 6 seconds.?

c.) When will R2 be at his highest point?