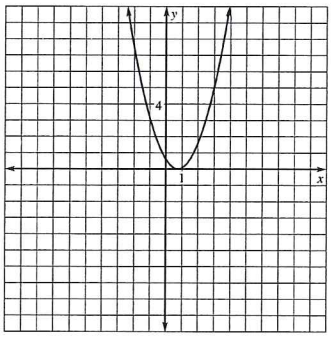
Name: _____ Class: _____ Date: _____ ID: A

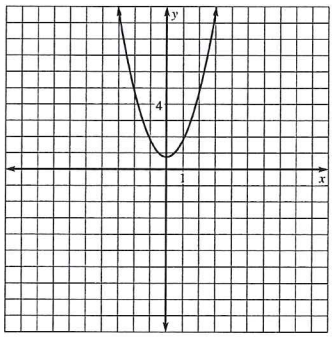
Graphing Quadratics Review

D 1. Sketch the graph of the equation $y=0.75x^2$.

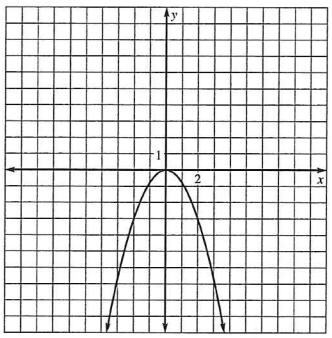
a.



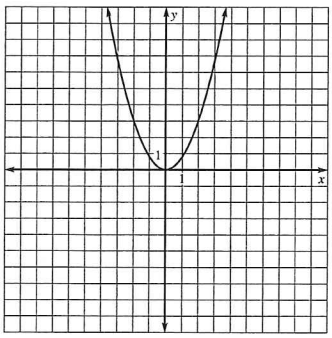
c.



b.

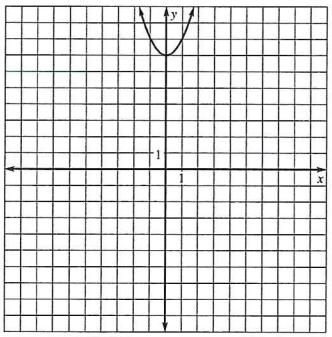


d.



D 2. Sketch the graph of the equation $y=-\frac{5}{7}x^2$.

a.



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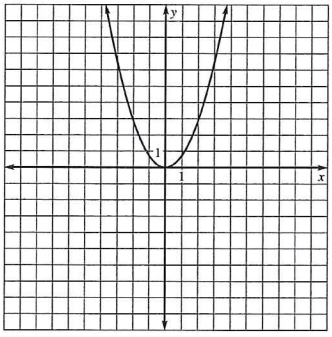
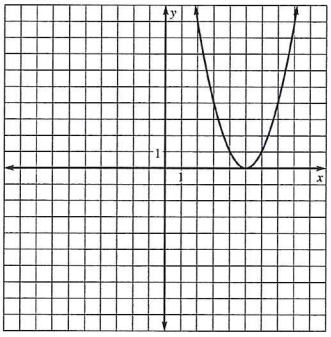
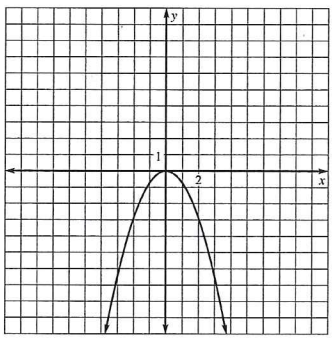


b.



d.



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B

3. Predict how the graph of the equation $y=7x^2$ will compare with the graph of the equation $y = x^2$.
   a. The graph of $y=7x^2$ will open down because coefficient is positive. The graph will be narrower because 7 is greater than 1.
   b. The graph of $y=7x^2$ will open up because the coefficient is positive. The graph will be narrower because 7 is greater than 1.
   c. The graph of $y=7x^2$ will open down because coefficient is positive. The graph will be wider because 7 is greater than 1.
   d. The graph of $y=7x^2$ will open up because the coefficient is positive. The graph will be wider because 7 is greater than 1.

A

4. How would you translate the graph of $y = -x^2$ to produce the graph of $y = -x^2 - 4$?
   a. translate the graph of $y = -x^2$ down 4 units
   b. translate the graph of $y = -x^2$ up 4 units
   c. translate the graph of $y = -x^2$ left 4 units
   d. translate the graph of $y = -x^2$ right 4 units

Describe how the graph of the function compares to the graph of $y = x^2$.

5. $y=3x^2$ steeper because $3 > 1$.

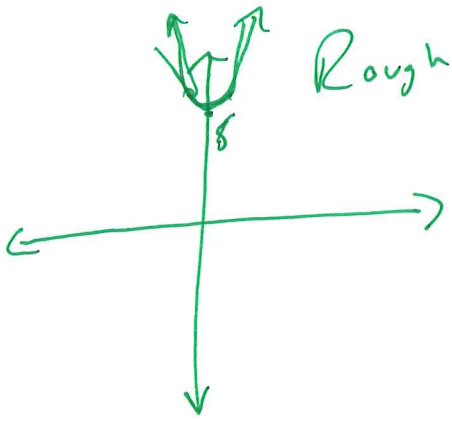
6. $y=-4x^2$ Flipped and steeper b/c $4 > 1$, opens down

7. $y = 4x^2$ steeper b/c $4 > 1$

8. How would you shift the graph of $y = x^2$ to produce the graph of $y = x^2 - 8$?
   Shift the graph down 8 units

Graph the function. Compare the graph with the graph of $y = x^2$.

9. $y = x^2 + 8$
   The graph should be shifted up 8 units



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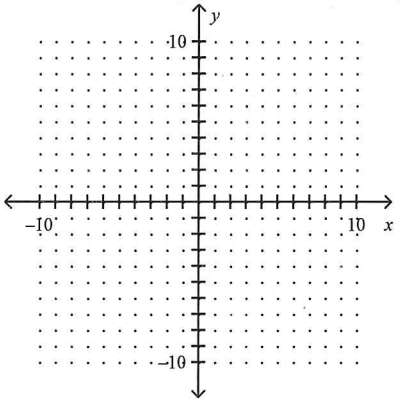
Graph:

10. $y = 2x^2 - 2x + 1$



$x = \frac{+2}{2(2)} = \frac{2}{4} = \frac{1}{2}$

$2(\frac{1}{2})^2 - 2(\frac{1}{2}) + 1$

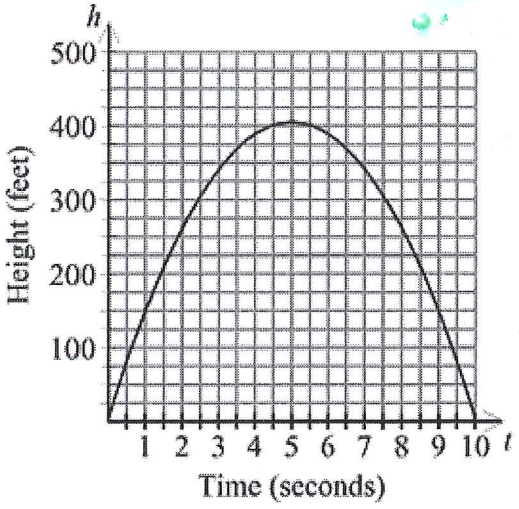
$2(\frac{1}{4}) - \frac{2}{2} + \frac{2}{2}$

Imaginary Roots

11. Find the coordinates of the vertex and determine whether the graph opens *up* or *down*. $y = -x^2 + x - 5$

$x = -b/2a$ $\frac{-1}{2(-1)} = 1/2$ $y = -(\frac{1}{2})^2 + \frac{1}{2} - 5$ $-4\frac{3}{4}$ $(\frac{1}{2}, -4\frac{3}{4})$ $(\frac{1}{2}, -4.75)$

12. A rocket leaves the barrel of a launcher at a height of 5 feet off the floor, with an initial velocity of 160 feet per second. The equation describing the rocket's height after t seconds is $h = -16t^2 + 160t + 5$. The graph below shows the rocket's height as a function of time.



$x = \frac{-b}{2a}$ $\frac{-160}{2(-16)} = 5$

$h = -16(5)^2 + 160(5) + 5$

$h = 405$ ft

What is the maximum height reached by the rocket and how many seconds did it take for the rocket to reach that height? Estimate the height value to the nearest 25 feet and the time value to the nearest tenth of a second. It takes 5 seconds to reach 400 ft

Find the *vertex* and the *axis of symmetry* of the parabola.

13. $y = -3x^2 + 12x - 8$ $x = \frac{-b}{2a}$ $\frac{-12}{2(-3)} = \frac{-12}{-6} = 2$ / $y = -3(2)^2 + 12(2) - 8 = 4$

(2, 4) axis of symmetry $x = 2$

14. $y = 3x^2 + 12x + 9$

(-2, -3)

Axis $x = -2$

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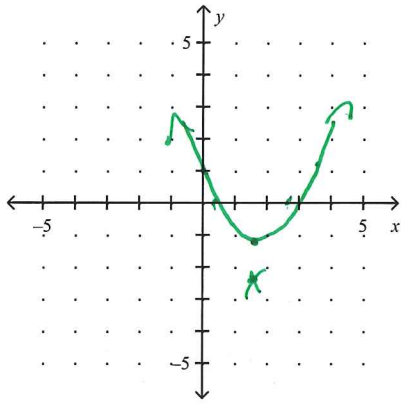
State the *x*-intercepts of the graph of the equation. Then find the coordinates of the vertex.

15. $y = (x+4)(x-9)$ $x+4=0$ $x-9=0$ $x=-4, 9$ $y=x^2-5x-36$ $x=\frac{-b}{2a}=\frac{5}{2}$ $y=\left(\frac{5}{2}\right)^2-5\left(\frac{5}{2}\right)-36=\frac{-169}{4}$ $\left(\frac{5}{2}, \frac{-169}{4}\right)$

Solve the equation by graphing, approximate your answers to the nearest tenth.

16. $x^2 - 3x + 1 = 0$



$x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}=\frac{3\pm\sqrt{(-3)^2-4(1)(1)}}{2}$

$x=\frac{-b}{2a}$

$x=\frac{3}{2}$

$=\frac{3\pm\sqrt{9-4}}{2}$

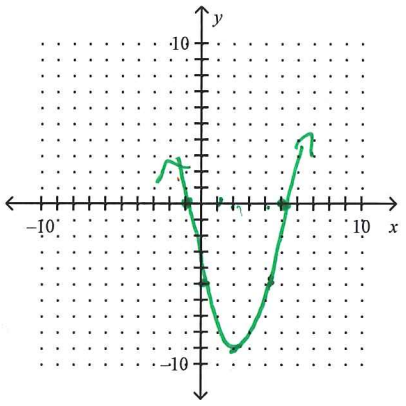
$x=\frac{3\pm\sqrt{5}}{2}$

$y=\left(\frac{3}{2}\right)^2-3\left(\frac{3}{2}\right)+1$

$y=\frac{9}{4}-\frac{9}{2}+\frac{4}{4}$

$y=\frac{9}{4}-\frac{18}{4}+\frac{4}{4}=\frac{-5}{4}$

17. $x^2 - 4x - 5 = 0$



$0=(x-5)(x+1)$

$x-5=0$ $+5\ +5$ $x=5$

$x+1=0$ $-1\ -1$ $y=-1$

$x=\frac{-(-4)}{2(1)}=2$

$2^2-4(2)-5$

$4-8-5=-9$

$(2,-9)$

Graph the following function, and determine the zeros, if there are any.

18. $f(x) = 3x^2 - 9x + 6$ $3(x^2-3x+2)$ $3(x-2)(x-1)$ $x=2,1$

Find the zeros of the function.

19. $f(x) = 2x^2 - 4x + 6$ $f(x)=$

20. $f(x) = x^2 + 4x - 12$ $=(x+6)(x-2)$ $x=-6,2$

21. $f(x) = x^2 + 14x + 45$ $=(x+5)(x+9)=0$

$x=-5,-9$

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22. $f(x) = x^2 - 8x + 16$ $0 = (x-4)^2$ $0 = x-4$ $x = 4$

23. $f(x) = x^2 - 3x + 2$ $0 = (x-2)(x-1)$ $x = 3, 1$

24. $f(x) = x^2 + 6x + 9$ $0 = (x+3)^2$ $0 = x+3$ $x = -3$

Solve the equation by completing the square.

A 25. $2x^2 + 4x - 5 = 0$

$a = 2$, $b = 4$, $c = -5$

$x = \frac{-4 \pm \sqrt{4^2 - 4(2)(-5)}}{2(2)}$

$x = \frac{-4 \pm \sqrt{16 + 40}}{4}$

$x = \frac{-4 \pm \sqrt{56}}{4}$

$\sqrt{56}$, $8 \cdot 7$, $2 \cdot 4$, $2 \cdot 2$, $2\sqrt{14}$

$x = \frac{-4 \pm 2\sqrt{14}}{4}$

a. $\frac{-2 \pm \sqrt{14}}{2}$ b. $\frac{2 \pm \sqrt{14}}{2}$ c. $\frac{-2 \pm 2\sqrt{14}}{2}$ d. $2 \pm \sqrt{14}$

26. $t^2 + 6t - 3 = 0$ $x = -3 \pm \sqrt{12}$

27. $r^2 - 4r - 7 = 0$ $r^2 - 4r - 7 = 0$, $+7 \quad +7$, $r^2 - 4r + \frac{4}{} = 7 + 4$, $r^2 - 4r + 4 = 11$, $(r-2)^2 = 11$, $r - 2 = \pm\sqrt{11}$, $+2 \quad +2$, $r = 2 \pm \sqrt{11}$ ($(\frac{-4}{2})^2$)

28. $w^2 + 5w + 2 = 0$ $\frac{-5}{2} \pm \frac{\sqrt{17}}{2}$

Find the value of *c* that makes the expression a perfect square trinomial.

29. $x^2 + 22x + c$ $\left(\frac{22}{2}\right)^2 = 121$

30. $x^2 + 15x + c$ $\left(\frac{15}{2}\right)^2 = \frac{225}{4}$

Solve the quadratic equation.

D 31. $x^2 + 8x + 14 = 0$

a. $4 + \sqrt{2}, 4 - \sqrt{2}$

b. $-8 + 2\sqrt{2}, -8 - 2\sqrt{2}$

c. $8 + 2\sqrt{2}, 8 - 2\sqrt{2}$

d. $-4 + \sqrt{2}, -4 - \sqrt{2}$

Use the quadratic formula to solve the equation.

A 32. $x^2 = 15x - 34$

a. $\frac{15 - \sqrt{89}}{2}, \frac{15 + \sqrt{89}}{2}$

b. $-15 - \sqrt{89}, -15 + \sqrt{89}$

c. $15 - \sqrt{89}, 15 + \sqrt{89}$

d. $\frac{-15 - \sqrt{89}}{2}, \frac{-15 + \sqrt{89}}{2}$

33. $x^2 + 7x + 7 = 0$

$x = \frac{-7 \pm \sqrt{21}}{2}$