

1. Find the axis of symmetry, vertex, and y-intercept of the following.

a). $y = x^2 - 7$
 $x = \frac{0}{2 \cdot 1} = \frac{0}{2} = 0$

vertex = $(0, -7)$

y-int. = $(0, -7)$

b). $y = -x^2 + 5x - 3$
 $x = \frac{-5}{2 \cdot -1} = \frac{-5}{-2} = 2.5$

vertex = $(2.5, 3.25)$

y-int. = $(0, -3)$

c). $y = x^2 + 2x + 6$
 $x = \frac{-2}{2 \cdot 1} = \frac{-2}{2} = -1$

vertex = $(-1, 5)$

y-int. = $(0, 6)$

2. Simplify each expression.

a). $(3 + 4i) + (7 - 2i)$
 $3 + 4i - 7 + 2i$
 $-4 + 6i$

b). $(5 - i)(9 + 6i)$
 $5(9 + 6i) - i(9 + 6i)$
 $45 + 30i - 9i - 6i^2$
 $45 + 21i + 6$
 $51 + 21i$

c). $(3 + 8i) + (5 - 2i)$
 $8 + 6i$

d). $-4 - \sqrt{-9}$
 $-4 - \sqrt{i^2 \cdot 9}$
 $-4 - 3i$

e). $\sqrt{-36}$
 $\sqrt{i^2 \cdot 36}$
 $6i$

f). $\sqrt{-32}$
 $\sqrt{i^2 \cdot 16 \cdot 2}$
 $4i\sqrt{2}$

3. Evaluate the discriminant. Tell how many solutions there are and if they are real or imaginary. (type)

a). $y = x^2 + 10x - 25$
 $10^2 - 4(1)(-25)$
 0

one sol.

b). $y = -x^2 + 3x - 5$
 $3^2 - 4(-1)(-5)$
 -11

2 image. sol.

c). $y = 2x^2 - 13x - 7$
 $(-13)^2 - 4(2)(-7)$
 225

2 real solutions

4. Solve each quadratic using the quadratic formula.

a). $2x^2 - 5x - 3 = 0$

$x = \frac{5 \pm \sqrt{(5)^2 - 4(2)(-3)}}{2 \cdot 2}$

$x = \frac{5 \pm \sqrt{49}}{4}$

$x = \frac{5+7}{4} = \frac{12}{4} = 3$ $x = \frac{5-7}{4} = \frac{-2}{4} = \frac{-1}{2}$

b). $3x^2 - 10x + 5 = 0$

$x = \frac{10 \pm \sqrt{(10)^2 - 4(3)(5)}}{3 \cdot 2}$

$x = \frac{10 \pm \sqrt{40}}{6}$

$x = \frac{10 \pm \sqrt{4 \cdot 10}}{6}$

$x = \frac{10 \pm 2\sqrt{10}}{6} = \frac{5 \pm \sqrt{10}}{3}$

$4x^2 + 4x - 22 = 0$

c). $4x^2 + 4x = 22$

$= \frac{-4 \pm \sqrt{4^2 - 4(4)(-22)}}{2 \cdot 4}$

$= \frac{-4 \pm \sqrt{368}}{8}$

$= \frac{-4 \pm \sqrt{16 \cdot 23}}{8}$

$= \frac{-4 \pm 4\sqrt{23}}{8}$

5. Solve each quadratic by factoring.

a). $x^2 - 4x - 60 = 0$

$(x-10)(x+6) = 0$

$x-10=0$ $x+6=0$

$x=10$ $x=-6$

b). $x^2 + 2x - 24 = 0$

$(x+6)(x-4) = 0$

$x+6=0$ $x-4=0$

$x=-6$ $x=4$

c). $y^2 - 9y = -14$

$y^2 - 9y + 14 = 0$

$(y-2)(y-7) = 0$

$y-2=0$ $y-7=0$

$y=2$ $y=7$

$x = \frac{1 \pm \sqrt{23}}{2}$

6. Solve each quadratic by using SQUARE ROOTS.

a). $2x^2 + 3 = 35$

$$2x^2 = 32$$

$$\sqrt{x^2} = \sqrt{16}$$

$$x = \pm 4$$

b). $x^2 - 16 = 0$

$$x^2 = 16$$

$$\sqrt{x^2} = \sqrt{16}$$

$$x = \pm 4$$

c). $\sqrt{(x+3)^2} = \sqrt{25}$

$$x+3 = \pm 5$$

$$x+3 = 5 \text{ or } x+3 = -5$$

$$x = 2$$

$$x = -8$$

7. Solve the quadratic by using your graphing calculator.

a). $2x^2 - 5x - 4 = 0$

b). $x^2 + 5x + 3 = 0$

c). $9x^2 + 6x = -1$

8. For each equation, give the end behavior, domain and range, and tell what intervals the graph is increasing and decreasing.

a). $y = x^2 - 2x + 2$

End Behavior:

Domain:

Range:

Increasing:

Decreasing:

b). $y = |x + 1| - 4$

End Behavior:

Domain:

Range:

Increasing:

Decreasing:

c). $y = -2|x - 2| + 3$

End Behavior:

Domain:

Range:

Increasing:

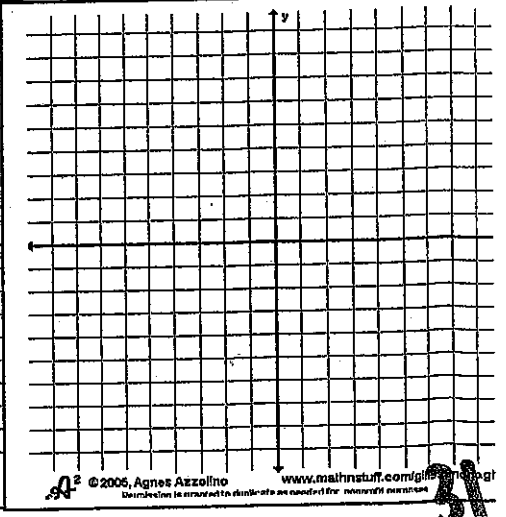
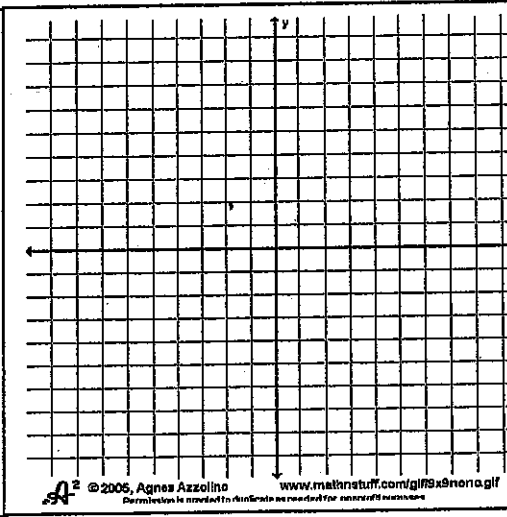
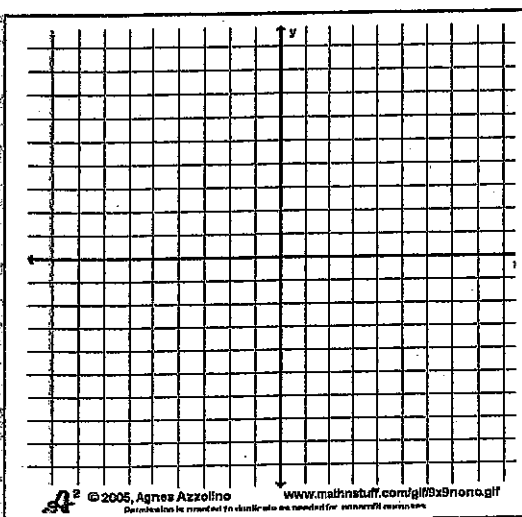
Decreasing:

9. Graph equation 8a, 8b, and 8c. Make sure you include the vertex and four other points.

9a).

9b).

9c).



31