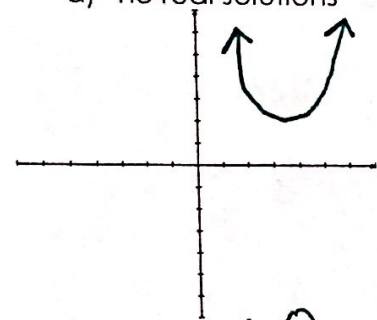


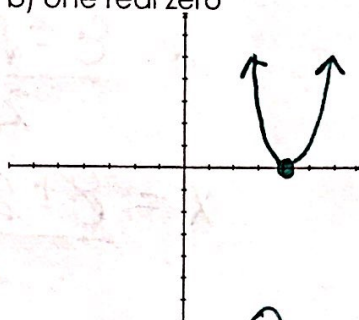
1. Sketch a quadratic function the following solutions. Then describe what the discriminant would look like:

a) no real solutions



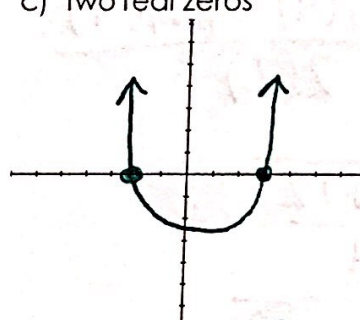
Discriminant: < 0
 (ex. -20)

b) one real zero



Discriminant: 0

c) two real zeros



Discriminant: > 0
 (ex. 5)

2. Find the discriminant for each equation, and then find the solutions.

a) $f(x) = 4x^2 + 4x + 1$

$$X = \frac{-4 \pm \sqrt{(4)^2 - 4(4)(1)}}{2(4)}$$

$$X = \frac{-4 \pm \sqrt{0}}{8}$$

$$X = \frac{-4 \pm 0}{8} \quad \begin{cases} \frac{-4+0}{8} = \frac{-4}{8} = -\frac{1}{2} \\ \frac{-4-0}{8} = \frac{-4}{8} = -\frac{1}{2} \end{cases}$$

Discriminant: 0

Number of Solutions: 1 real

Solutions: $X = -\frac{1}{2}$

b) $0 = -2x^2 - 10x$

$$X = \frac{10 \pm \sqrt{(-10)^2 - 4(-2)(0)}}{2(-2)}$$

$$X = \frac{10 \pm \sqrt{100}}{-4}$$

$$X = \frac{10 \pm 10}{-4} \quad \begin{cases} \frac{10+10}{-4} = \frac{20}{-4} = -5 \\ \frac{10-10}{-4} = \frac{0}{-4} = 0 \end{cases}$$

Discriminant: 100

Number of Solutions: 2 real

Solutions: $X = -5$ or 0

Algebra 1

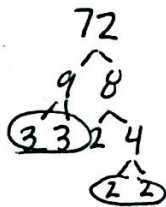
c) $2x^2 + 4x = 7$
 $\quad \quad \quad -7 \quad -7$

$$\frac{2x^2 + 4x - 7}{a \quad b \quad c} = 0$$

$$X = \frac{-4 \pm \sqrt{(4)^2 - 4(2)(-7)}}{2(2)}$$

$$X = \frac{-4 \pm \sqrt{72}}{4}$$

$$X = \frac{-4 \pm 6\sqrt{2}}{4}$$



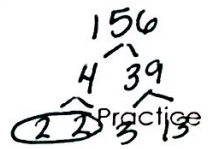
Unit 9 - Quadratic Equations

d) $f(x) = x^2 - 8x - 23$
 $\quad \quad \quad a \quad b \quad c$

$$X = \frac{8 \pm \sqrt{(-8)^2 - 4(1)(-23)}}{2(1)}$$

$$X = \frac{8 \pm \sqrt{156}}{2}$$

$$X = \frac{8 \pm 2\sqrt{39}}{2}$$



Discriminant: 72

Number of Solutions: 2 real

Solutions: $X = \frac{-2 \pm 3\sqrt{2}}{2}$

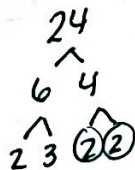
$X = 1.12$ or -3.12

e) $f(x) = 3x^2 + 6x + 1$
 $\quad \quad \quad a \quad b \quad c$

$$X = \frac{-6 \pm \sqrt{(6)^2 - 4(3)(1)}}{2(3)}$$

$$X = \frac{-6 \pm \sqrt{24}}{6}$$

$$X = \frac{-6 \pm 2\sqrt{6}}{6}$$



Discriminant: 24

Number of Solutions: 2 real

Solutions: $X = \frac{-3 \pm \sqrt{6}}{3}$

$X = -0.18$ or -1.82

Discriminant: 156

Number of Solutions: 2 real

Solutions: $X = 4 \pm \sqrt{39}$

$X = 10.24$ or -2.24

f) $5x^2 - 10x = -5$
 $\quad \quad \quad +5 \quad +5$

$$\frac{5x^2 - 10x + 5}{a \quad b \quad c} = 0$$

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

$$X = \frac{10 \pm \sqrt{0}}{10}$$

$$X = \frac{10 \pm 0}{10} = \frac{10}{10} = 1$$

Discriminant: 0

Number of Solutions: 1 real

Solutions: $X = 1$