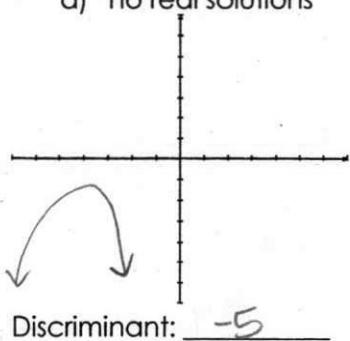


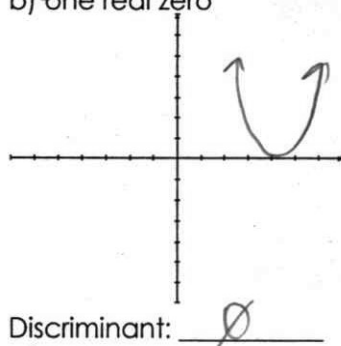
Practice Assignment

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

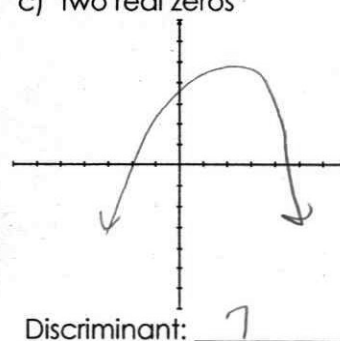
*\*answers will vary*  
 a) no real solutions



b) one real zero



c) two real zeros



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

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

$a=4$   
 $b=4$   
 $c=1$

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

$$\frac{-4 \pm \sqrt{0}}{8} \rightarrow \frac{-4}{8} \rightarrow \boxed{-\frac{1}{2}}$$

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

$a=-2$   
 $b=-10$   
 $c=0$

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

$$\frac{10 \pm \sqrt{100}}{-4} \rightarrow \frac{10 \pm 10}{-4}$$

$$\frac{10+10}{-4} \quad \& \quad \frac{10-10}{-4}$$

$$\downarrow \quad \downarrow$$

$$-5 \quad \emptyset$$

Discriminant: ∅

Number of Solutions: One real

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

Discriminant: 100

Number of Solutions: 2 real

Solutions:  $x = -5$  or  $x = 0$

c)  $2x^2 + 4x = 7$

$-7-7$

$2x^2 + 4x - 7 = 0$

$a=2$   
 $b=4$   
 $c=-7$

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

$$\rightarrow \frac{-4 \pm \sqrt{16}}{4} \rightarrow \frac{-4 \pm \sqrt{36+28}}{4}$$

$$\frac{-4 \pm 6\sqrt{2}}{4^2} \rightarrow \boxed{\frac{-2 \pm 3\sqrt{2}}{2}}$$

Discriminant: 72

Number of Solutions: 2 real

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

e)  $f(x) = 3x^2 + 6x + 1$

$a=3$   
 $b=6$   
 $c=1$

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

$$\rightarrow \frac{-6 \pm \sqrt{24}}{6} \rightarrow \frac{-6 \pm \sqrt{4 \cdot 6}}{6}$$

$$\frac{-3 \pm 2\sqrt{6}}{3 \cdot 2} \rightarrow \boxed{\frac{-3 \pm \sqrt{6}}{3}}$$

Discriminant: 24

Number of Solutions: 2 real

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

d)  $f(x) = x^2 - 8x - 23$

$a=1$   
 $b=-8$   
 $c=-23$

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

$$\rightarrow \frac{8 \pm \sqrt{156}}{2} \rightarrow \frac{8 \pm \sqrt{4 \cdot 39}}{2}$$

$$\rightarrow \frac{8 \pm 2\sqrt{39}}{2} \rightarrow \boxed{4 \pm \sqrt{39}}$$

Discriminant: 156

Number of Solutions: 2 real

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

f)  $5x^2 - 10x = -5$

$-5+5$

$5x^2 - 10x - 5 = 0$

$a=5$   
 $b=-10$   
 $c=-5$

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

$$\rightarrow \frac{10 \pm \sqrt{200}}{10} \rightarrow \frac{10 \pm \sqrt{100 \cdot 2}}{10}$$

$$\rightarrow \frac{10 \pm 10\sqrt{2}}{10} \rightarrow \boxed{1 \pm \sqrt{2}}$$

Discriminant: 200

Number of Solutions: 2 real

Solutions:  $x = 1 \pm \sqrt{2}$