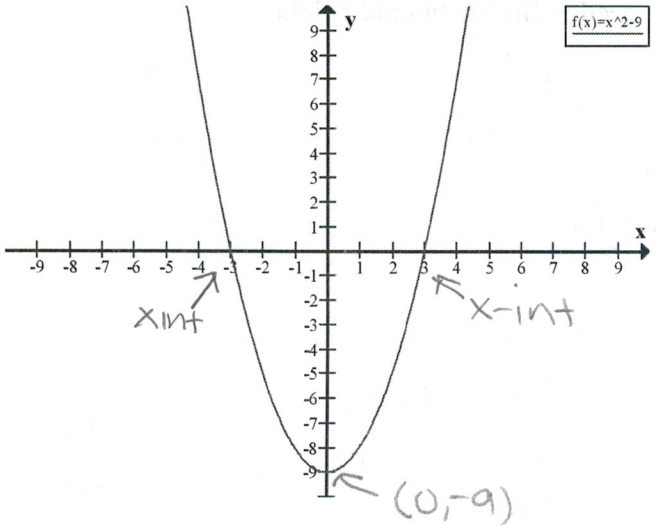
2.1 Practice Problems

1. a. Use the graph to find the x-intercepts.

(-3,0), (3,0)

b. Use the graph to find the y-intercepts.

(0,-9)

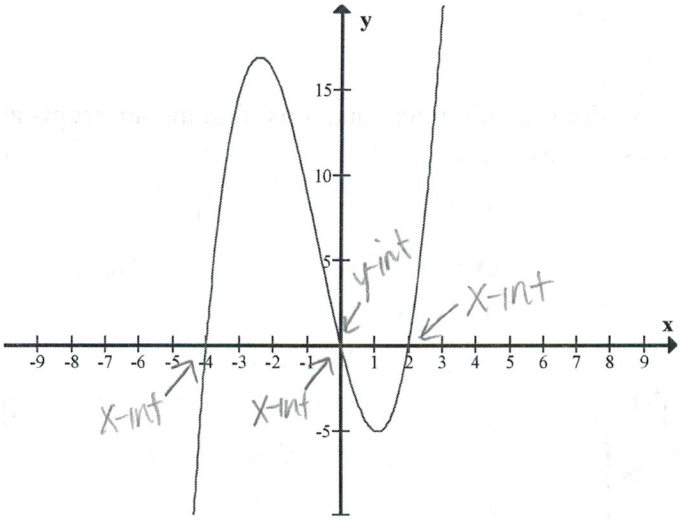


2. a. Use the graph to find the x-intercepts.

(-4,0) (0,0) (2,0)

b. Use the graph to find the y-intercepts.

(0,0)



3. Graph the linear equation using intercepts.

$4x-5y=20$

X-int y=0

$4x-5(0)=20$

$\frac{4x}{4}=\frac{20}{4}$

$x=5$

(5,0)

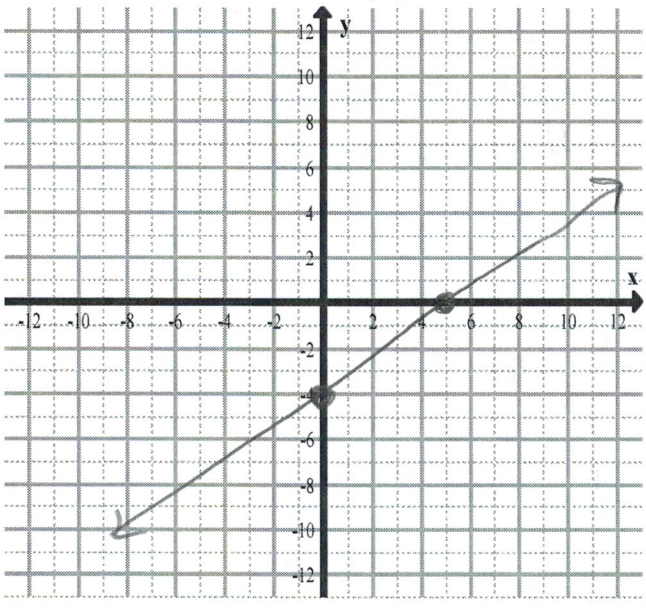
y-int x=0

$4(0)-5y=20$

$\frac{-5y}{-5}=\frac{20}{-5}$

$y=-4$

(0,-4)



4. For the equation $y=-2(x-3)^2+8$ find the x and y intercepts and graph the function. You may need to find additional points.

X-int $y=0$

$0=-2(x-3)^2+8$

$-8 \quad -8$

$\frac{-8}{-2}=\frac{-2(x-3)^2}{-2}$

$4=(x-3)^2$

$\sqrt{4}=\sqrt{(x-3)^2}$ (5,0)

$\pm 2 = x-3$ (1,0)

$+3 \quad +3$ x-int

$3 \pm 2 = x$

$3+2, 3-2=x$

$5, 1 = x$

y-int $x=0$

$y=-2(0-3)^2+8$

$=-2(-3)^2+8$

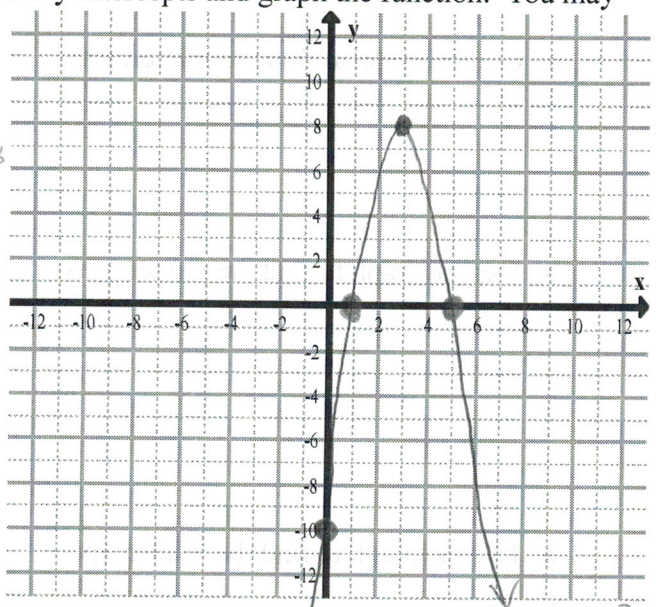
$=-2(9)+8$

$=-18+8$

$=-10$

$(0,-10)$

y-int



Because of symmetry the vertex will occur halfway between the x-intercepts choose $x=3$

$y=-2(3-3)^2+8$

$=-2(0)^2+8$

$=8$

$(0,8) \rightarrow$ vertex

5. For the following equations, find the intercepts and test for symmetry.

a) $y=x^4-16$

y-int $x=0$

$y=0^4-16$

$=-16$

$(0,-16)$

X-int $y=0$

$0=x^4-16$

$0=(x^2+4)(x^2-4)$

$0=(x^2+4)(x+2)(x-2)$

$x^2+4=0 \quad x+2=0 \quad x-2=0$

$x^2=-4 \quad x=-2 \quad x=2$

$\sqrt{x^2}=\sqrt{-4}$ x-int

$x=\pm 2i$ $(-2,0)(2,0)$

x-axis

$-y=x^4-16$

no

y-axis

$y=(-x)^4-16$

$y=x^4-16$

yes

origin

$-y=(-x)^4-16$

$y=x^4-16$

no

b) $25x^2+4y^2=100$

y-axis

$25(-x)^2+4y^2=100$

$25x^2+4y=100$

yes

x-axis

$25x^2+4(-y)^2=100$

$25x^2+4y^2=100$

yes

origin

$25(-x)^2+4(-y)^2=100$

$25x^2+4y^2=100$

yes

x-int $y=0$

$25x^2+4(0)^2=100$

$\frac{25x^2}{25}=\frac{100}{25}$

$x^2=4$

$x=\pm 2$

$(2,0)(-2,0)$

y-int $x=0$

$25(0)^2+4y^2=100$

$\frac{4y^2}{4}=\frac{100}{4}$

$y^2=25$

$y=\pm 5$

$(0,5)(0,-5)$

c) $y=x^3-8$

x-int $y=0$

$0=x^3-8$

$+8 \quad +8$

$8=x^3$

$\sqrt[3]{8}=\sqrt[3]{x}$

$2=x$

$(2,0)$

y-int $x=0$

$y=0^3-8$

$y=-8$

$(0,-8)$

x-axis

$-y=x^3-8$

no

y-axis

$y=(-x)^3-8$

$y=-x^3-8$

no

origin

$-y=(-x)^3-8$

$-y=-x^3-8$

$y=x^3+8$

no

d) $y^2=x+1$

x-axis

$(-y)^2=x+1$

$y^2=x+1$

yes

y-axis

$y^2=-x+1$

no

origin

$(-y)^2=-x+1$

$y^2=-x+1$

no

x-int $y=0$

$0^2=x+1$

$-1 \quad -1$

$-1=x$

$(-1,0)$

y-int

$y^2=0+1$

$y^2=1$

$y=\pm 1$

$(0,1)(0,-1)$