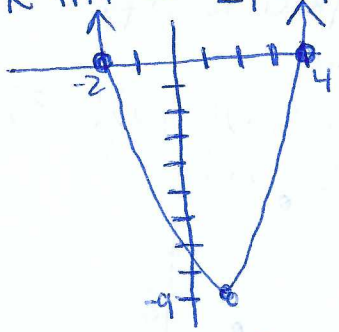
Graphing $f(x)=a(x-p)(x-q)$ 3.5 2days

Intercept form $y=a(x-p)(x-q)$ p & q are the x-intercepts

Ex 1. Graph. Label the vertex, axis of symmetry, x-intercepts, & describe the domain & range

a) $f(x)=(x+2)(x-4)$

x-int $=-2,+4$



find the middle of -2 & $+4$ to get the vertex

$\frac{-2+4}{2}=1$

$y=(1+2)(1-4)$
$=3(-3)=-9$

$V(1,-9)$

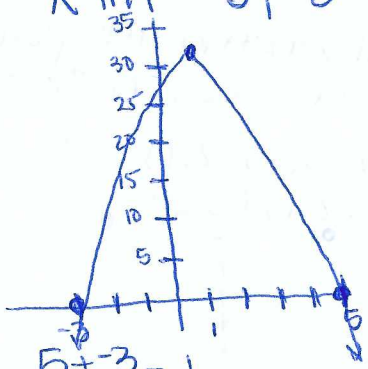
axis of sym $x=1$

D: all reals

R: $y\geq -9$

b) $g(x)=-2(x-5)(x+3)$

x-int $=5,-3$



$\frac{5+-3}{2}=1$

$y=-2(1-5)(1+3)$
$=-2(-4)(4)=32$

$V(1,32)$

axis of sym $x=1$

D: $\mathbb{R}$

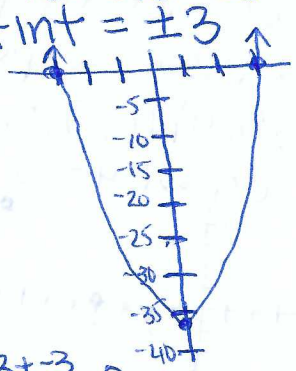
R: $y\leq 32$

c) $h(x)=4x^2-36$

*1st factor $4(x^2-9)$

$4(x+3)(x-3)$

x-int $=\pm 3$



$\frac{3+-3}{2}=0$

$y=4(0)^2-36=-36$

$V(0,-36)$

axis of sym $x=0$

D: $\mathbb{R}$

R: $y\geq -36$

3.5A HW p. 158 1, 3-6, 8-10, 13, 14, 16, 18

Warm Up. LIST the x-intercepts & state whether the graph points ↑ or ↓

1.) $f(x)=2(x+5)(x+3)$

2) $f(x)=-\frac{1}{4}(x+2)(x-7)$

Ex 1. Find the zeros

a) $f(x)=(x-5)(x+7)$

* the zeros are the x-int.

zeros: $+5,-7$

b) $h(x)=x^2-25$

$(x+5)(x-5)$

zeros: ± 5

c) $f(x)=2x^2-8x-24$

$2(x^2-4x-12)$

$2(x-6)(x+2)$

zeros: $+6,-2$

Ex 2. Write a quadratic func in standard form whose graph satisfies the given conditions.

a) vertex $(-2,1)$ ← use vertex form $y=a(x-h)^2+k$

b) x-intercepts $+1,5$ ← use intercept form $y=a(x-p)(x-q)$

c) passes thru $(-5,0)(4,0)$ & $(3,-16)$ → $y=a(x-p)(x-q)$

a) Since they don't give any other conditions, you can make a=1

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

$y=x^2+4x+4+1$

$\boxed{y=x^2+4x+5}$

← same

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

$\boxed{y=x^2-4x-5}$

$y=a(x+5)(x-4)$

now plug in the other pt to solve for a

$-16=a(3+5)(3-4)$

$-16=a(8)(-1)$

$-16=-8a$

$2=a$

$y=2(x+5)(x-4)$

$y=2(x^2+x-20)$

$y=2x^2+2x-40$

HW 3.5B p. 158 21-27odd, 29-36, 39, 40, 67-70