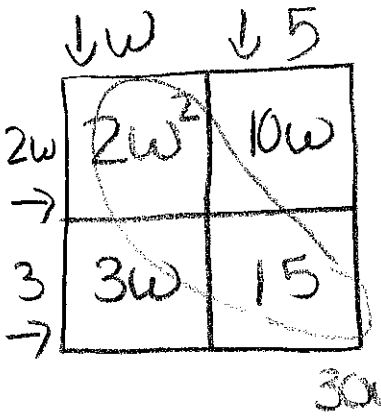
$2w^2 + 13w + 15$



S	P	F
13	$30w^2$	10, 3

Multiply to 30
Add to 13

$(2w + 3)(w + 5)$

Verify:

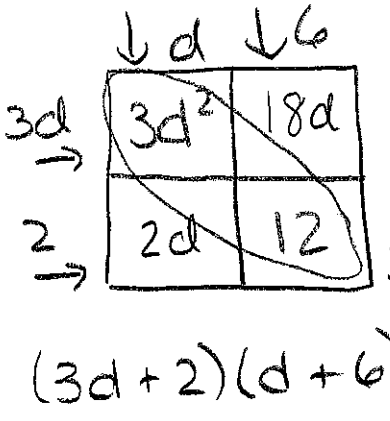
$(2w+3)(w+5)$

$2w^2 + 10w + 3w + 15$

$2w^2 + 13w + 15$ ✓

$3d^2 + 20d + 12$

S	P	F
20d	$36d^2$	18, 2



$(3d + 2)(d + 6)$

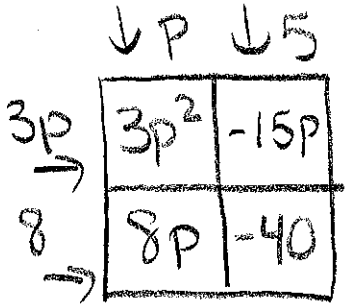
Verify:

$(3d+2)(d+6)$

$3d^2 + 18d + 2d + 12$

$3d^2 + 20d + 12$ ✓

$3p^2 - 7p - 40$



S	P	F
-7p	$-120p^2$	-15, 8

$(3p + 8)(p - 15)$

* middle term is negative, so make sure 5 gets neg, since it will be multiplied by 3

Verify:

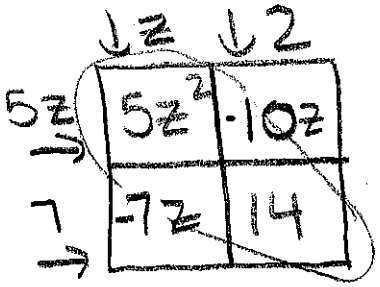
$(3p+8)(p-5)$

$3p^2 - 15p + 8p - 40$

$3p^2 - 7p - 40$

$5z^2 - 17z + 14$

S	P	F
-17z	$70z^2$	-10, -7



$(5z - 7)(z - 2)$

* need two neg to multiply for a pos, since middle term is neg

Verify:

$(5z-7)(z-2)$

$5z^2 - 10z - 7z + 14$

$5z^2 - 17z + 14$

$2m^2 - m - 15$

S	P	F
-1	$-30m^2$	-6, 5

	↓m	↓3
2m →	$2m^2$	-6m
5 →	5m	-15

$-30m^2$

$(2m + 5)(m - 3)$

$7c^2 - 2c - 9$

S	P	F
-2c	$-63c^2$	-9, 7

	↓7c	↓9
c →	$7c^2$	-9c
1 →	7c	-9

$-63c^2$

$(7c - 9)(c + 1)$

Verify:

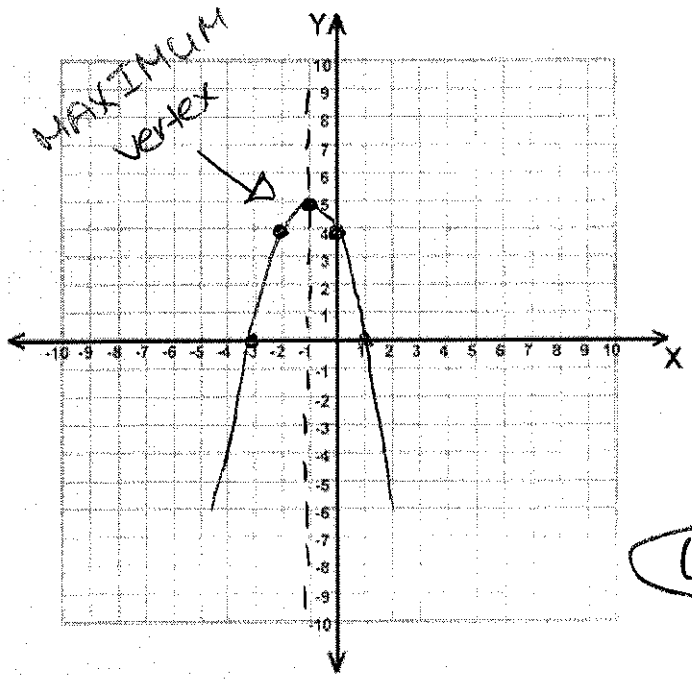
$(2m+5)(m-3) = 2m^2 - 6m + 5m - 15$

$2m^2 - m - 15$

Verify: $(7c-9)(c+1)$

$7c^2 + 7c - 9c - 9$

$7c^2 - 2c - 9$



Use symmetry to reflect graph

Graph: $y = -x^2 - 2x + 4$

$a = -1$

$b = -2$

$c = 4$

Axis of symmetry: $x = \frac{-b}{2a}$

$x = \frac{-(-2)}{2(-1)} = \frac{2}{-2} = -1$

Vertex Point: (Maximum or Minimum?)

a term is neg, graph opens down

$x = -1$

$(-1, 5)$

$y = -(-1)^2 - 2(-1) + 4$

$y = -1 + 2 + 4 \quad y = 5$

Y-Intercept:

when $x = 0$

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

$y = 4 \quad (0, 4)$

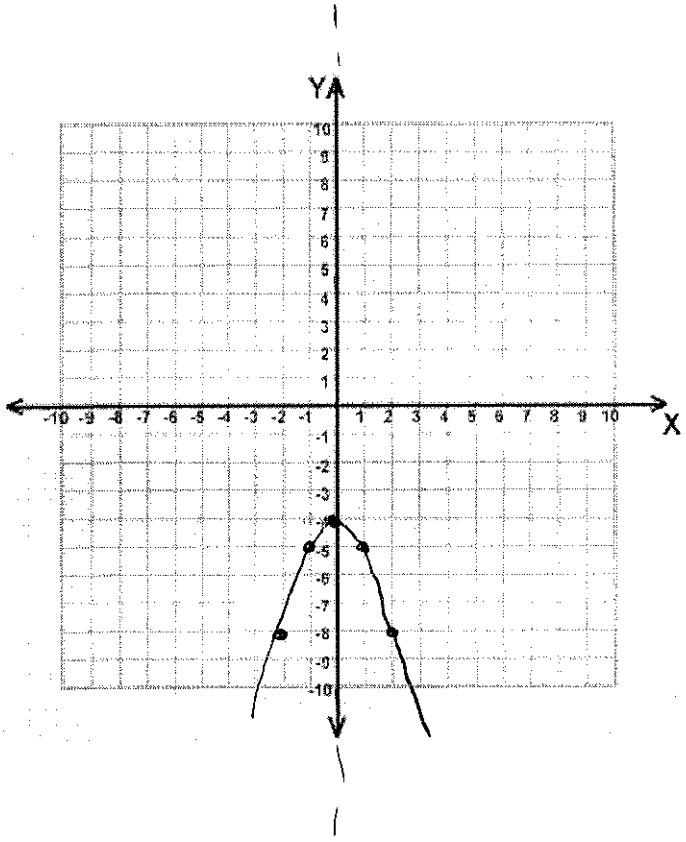
Additional Point:

Choose a point greater than -1

1 → $y = -(1)^2 - 2(1) + 4$

$y = -1 - 2 + 4 \quad (1, 1)$

$-3 + 4 = 1$



Graph: $y = -x^2 - 4$

Rewrite $-x^2 + 0x - 4$

$a = -1 \quad b = 0 \quad c = -4$

Axis of symmetry:

$x = \frac{-b}{2a} \quad x = \frac{0}{-2} = 0$

Vertex Point: (Maximum or Minimum?)

$x = 0$ since a term is neg, graph opens down

$y = 0^2 - 4$

$y = -4 \quad (0, -4)$

Y-Intercept:

$(0, -4)$

Additional Point:

* pick any point

$1 \rightarrow -(1)^2 - 4$

$-1 - 4$

$(1, -5)$

$2 \rightarrow -(2^2) - 4)$

$2 \rightarrow -4 - 4$

$(2, -8)$