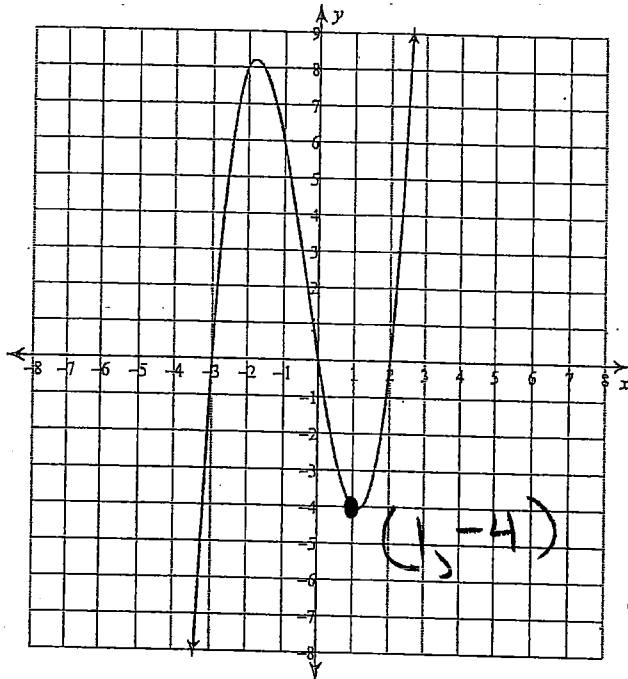


Polynomial Functions from a Graph

Write the Equation for the following graphs, in factored form.

1)



$$x = -3 \quad x = 0 \quad x = 2$$

$$y = a(x+3)(x)(x-2)$$

$$-4 = a(1+3)(1)(1-2)$$

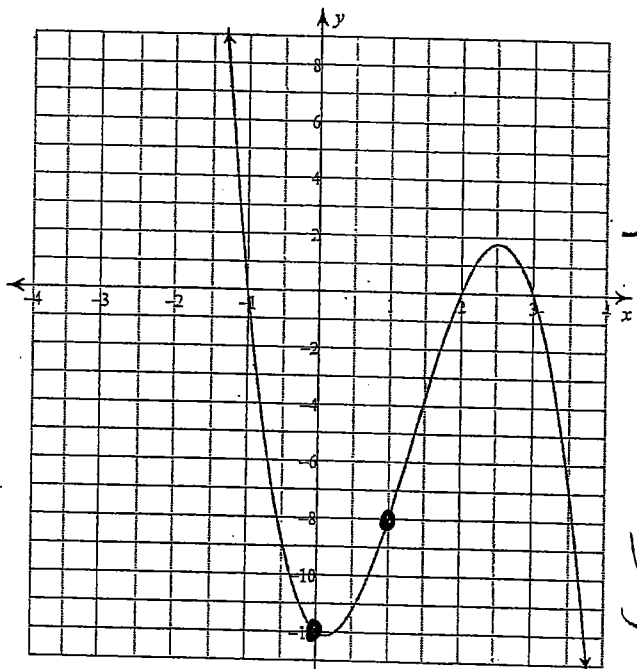
$$-4 = a(4)(1)(-1)$$

$$-4 = -4a$$

$$1 = a$$

$$y = x(x+3)(x-2)$$

2)



$$x = -1 \quad x = 2 \quad x = 3$$

$$y = a(x+1)(x-2)(x-3)$$

$$-12 = a(0+1)(0-2)(0-3)$$

$$-12 = a(1)(-2)(-3)$$

$$-12 = 6a$$

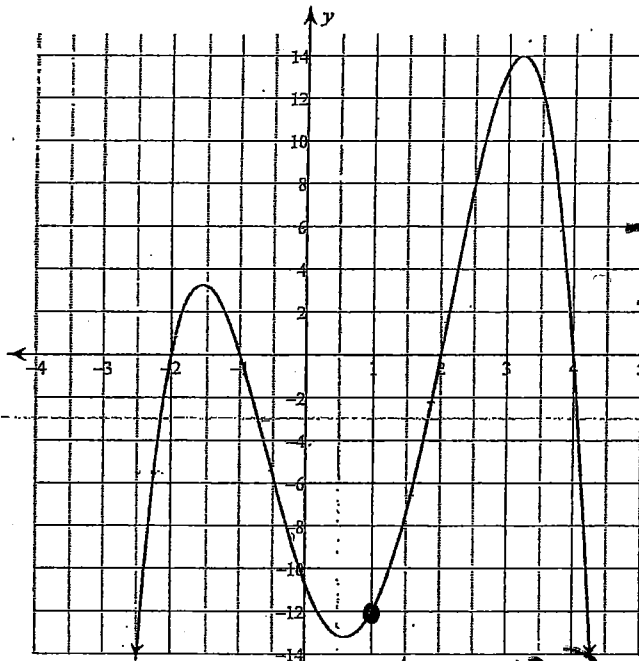
$$-2 = a$$

$$y = -2(x+1)(x-2)(x-3)$$

Use $(0, -12)$
or

$(1, -8)$

3)



$$x = -2 \quad x = -1 \quad x = 2 \quad x = 4$$

$$y = a(x+2)(x+1)(x-2)(x-4)$$

$$-12 = a(1+2)(1+1)(1-2)(1-4)$$

$$-12 = a(3)(2)(-1)(-3)$$

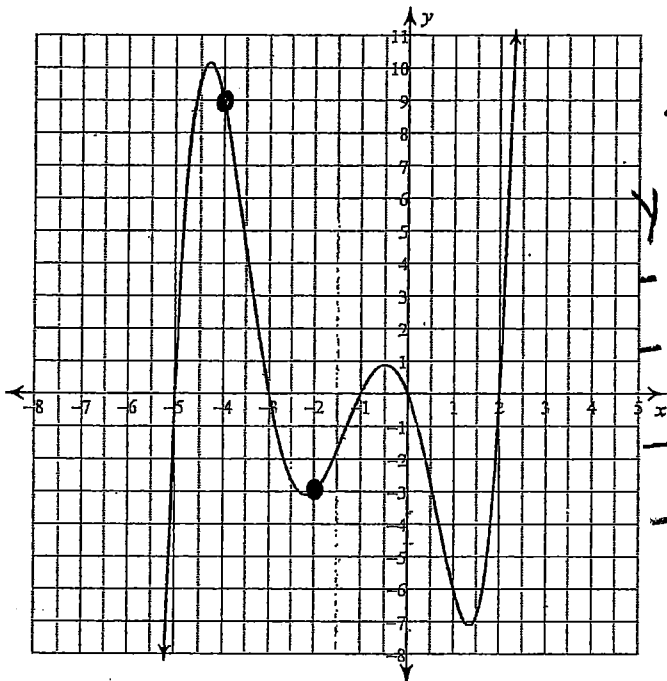
$$-12 = 18a$$

$$-\frac{12}{18} = a$$

$$-\frac{2}{3} = a$$

$$y = -\frac{2}{3}(x+2)(x+1)(x-2)(x-4)$$

4)



$$x = -5 \quad x = -3 \quad x = -1 \quad x = 0 \quad x = 2$$

$$y = a(x+5)(x+3)(x+1)x(x-2)$$

$$-3 = a(-2+5)(-2+3)(-2+1)(-2)(-2-2)$$

$$-3 = a(3)(1)(-1)(-2)(-4)$$

$$-3 = a(-24)$$

$$-3 = -24a$$

$$\frac{3}{24} = a$$

$$\frac{1}{8} = a$$

Use $(-4, 9)$

or

 $(-2, -3)$

$$y = \frac{1}{8}x(x+5)(x+3)(x+1)(x-2)$$