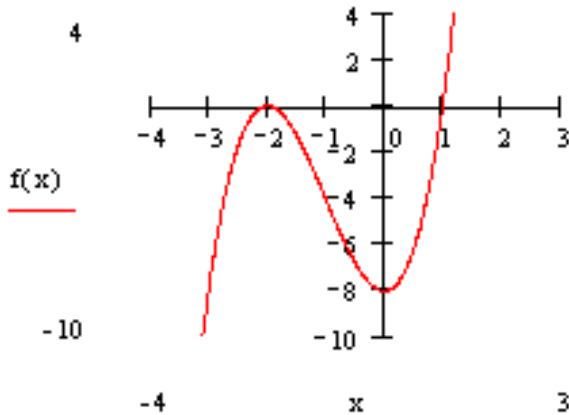


Defining Polynomial Functions from Graphs

Write the polynomial in the indicated degree that defines each of the following graphs.

1. 3rd degree, given the point (-1, -4).



$$P(x) = a(x+2)^2(x-1)$$

substitute the point (-1, -4) we have

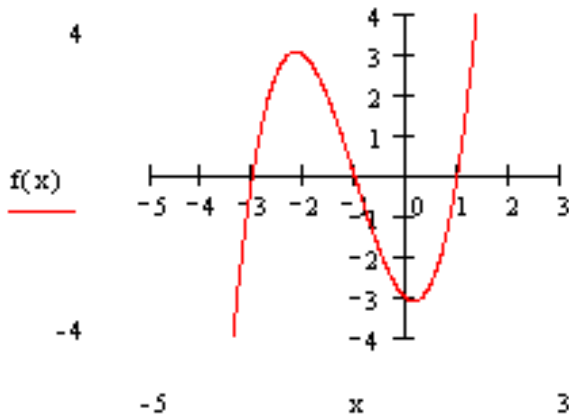
$$-4 = a(-1+2)^2(-1-1)$$

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

$$2 = a \quad \text{therefore the function is}$$

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

2. 3rd degree, given the point (-2, 3).



$$P(x) = a(x+3)(x+1)(x-1)$$

substitute the point (-2, 3) we have

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

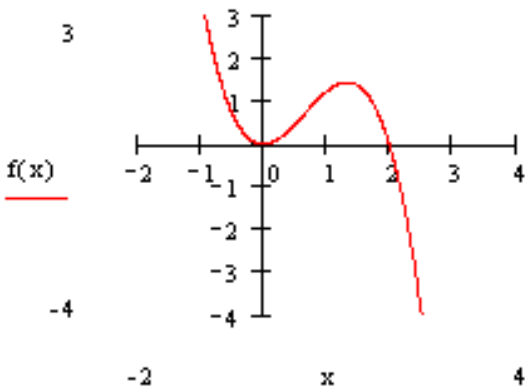
$$3 = a(1)(-1)(-3)$$

$$3 = a(3)$$

$$1 = a \quad \text{therefore the function is}$$

$$P(x) = (x+3)(x+1)(x-1)$$

3. 3rd degree, given the point (3, -11).



$$P(x) = ax^2(x-2)$$

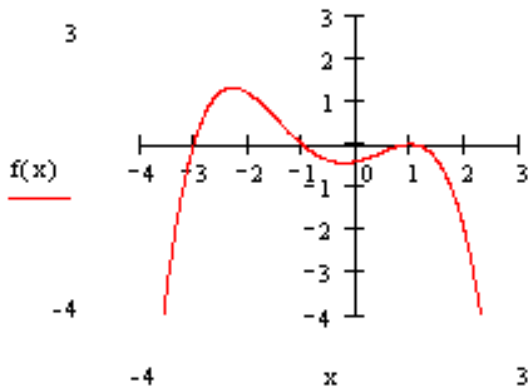
$$-11 = a(3)^2(3-2)$$

$$-11 = 9a$$

$$\frac{-11}{9} = a$$

$$P(x) = -\frac{11}{9}x^2(x-2)$$

4. 4th degree, given the point (2,-2).



$$P(x) = a(x+3)(x+1)(x-1)^2$$

substitute the point (2,-2) we have

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

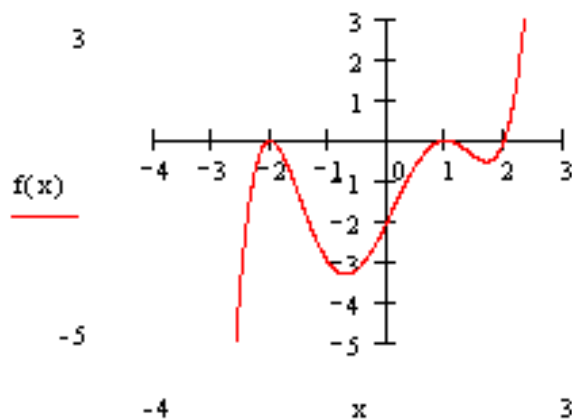
$$-2 = a(5)(3)(1)$$

$$-2 = a(15)$$

$$\frac{-2}{15} = a \quad \text{therefore the function is}$$

$$P(x) = -\frac{2}{15}(x+3)(x+1)(x-1)^2$$

5. 5th degree, given the point (-1,-3).



$$P(x) = a(x+2)^2(x-1)^2(x-2)$$

substitute the point (-1,-3) we have

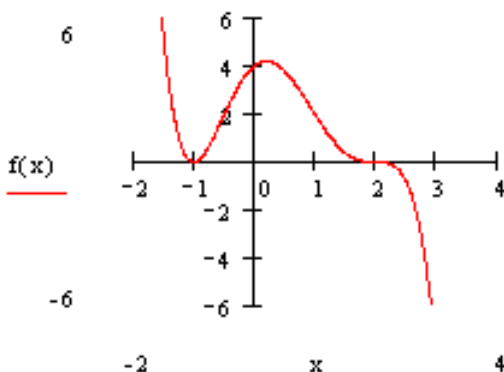
$$-3 = a(1)^2(-2)^2(-3)$$

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

$$\frac{-3}{-12} = a \quad \text{therefore the function is}$$

$$P(x) = \frac{1}{4}(x+2)^2(x-1)^2(x-2)$$

6. 5th degree, given the point (1,2).



$$P(x) = a(x+1)^2(x-2)^3$$

substitute the point (1,2) we have

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

$$2 = a(-4)$$

$$\frac{2}{-4} = a \quad \text{therefore the function is}$$

$$P(x) = -\frac{1}{2}(x+1)^2(x-2)^3$$