

Do Now - Factor the polynomials

$$30x^3 - 8x^2 - 6x$$

$$2x(15x^2 - 4x - 3)$$

$$\begin{array}{r} -45 \\ -9 \times 5 \\ -4 \end{array}$$

$$2x(15x^2 - 9x + 5x - 3)$$

$$2x(3x(5x-3) + 1(5x-3))$$

$$2x((3x+1)(5x-3))$$

$$2x(3x+1)(5x-3)$$

$$-12x^3 + 60x^2 - 8x + 40$$

$$-4(3x^3 - 15x^2 + 2x - 10)$$

$$-4(3x^2(x-5) + 2(x-5))$$

$$-4((3x^2 + 2)(x-5))$$

$$-4(3x^2 + 2)(x-5)$$

$$1000x^4y + 27xy^{10}$$

$$xy(1000x^3 + 27y^9)$$

$$xy((10x)^3 + (3y^3)^3)$$

$$xy((10x + 3y^3)(100x^2 - 30xy^3 + 9y^6))$$

$$xy(10x + 3y^3)(100x^2 - 30xy^3 + 9y^6)$$

$$50x^5 - 8xy^6$$

$$2x(25x^4 - 4y^6)$$

$$2x((5x^2)^2 - (2y^3)^2)$$

$$2x((5x^2 + 2y^3)(5x^2 - 2y^3))$$

$$2x(5x^2 + 2y^3)(5x^2 - 2y^3)$$

$$\begin{array}{r} x^2 + 5x - 14 \\ x^2 - 6x - 7 \overline{) x^4 - x^3 - 51x^2 + 49x + 98} \\ \underline{-(x^4 - 6x^3 - 7x^2)} \\ 5x^3 - 44x^2 + 49x + 98 \\ \underline{-(5x^3 - 30x^2 - 35x)} \\ -14x^2 + 84x + 98 \\ \underline{-(-14x^2 + 84x + 98)} \\ 0 \end{array}$$

$$x^4 - x^3 - 51x^2 + 49x + 98$$

$$(x^2 - 6x - 7)(x^2 + 5x - 14)$$

$$(x-7)(x+1)(x+7)(x-2)$$

Find the equation of least degree for the following polynomial function.

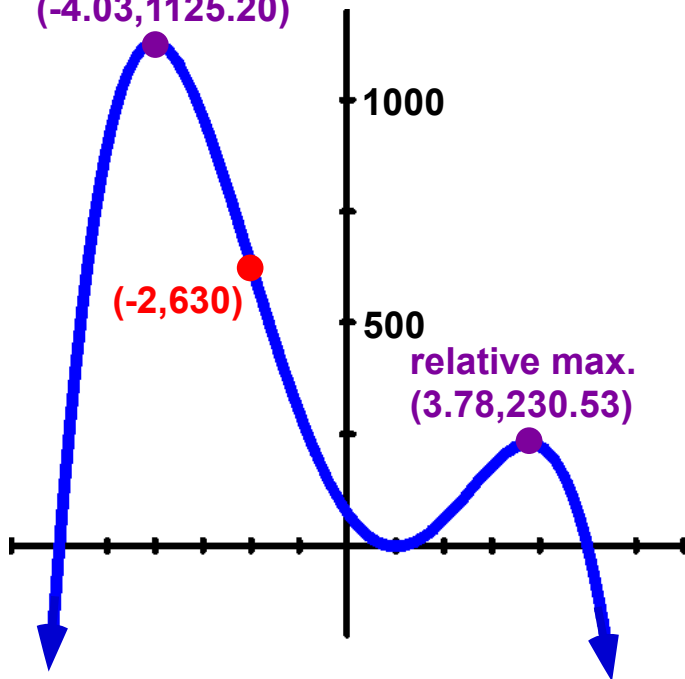
(a) Write the equation with 'a' as the lead coefficient.

(b) Use the given point to solve for 'a.'

(c) Find the y-intercept.

$$y = a(x+6)(x-1)^2(x-5)$$

absolute max.
(-4.03, 1125.20)



$$630 = a(-2+6)(-2-1)^2(-2-5)$$

$$630 = a(4)(9)(-7)$$

$$630 = -252a$$

$$a = -2.5$$

$$y = -2.5(x+6)(x-1)^2(x-5)$$

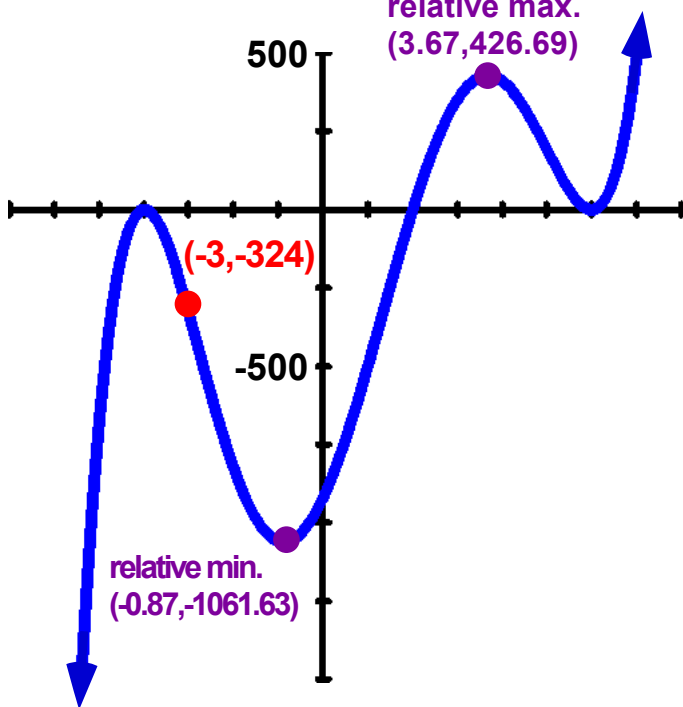
$$y = -2.5(0+6)(0-1)^2(0-5)$$

$$y = -2.5(6)(1)(-5)$$

$$y = 75$$

y-int.
(0, 75)

relative max.
(3.67, 426.69)



$$y = a(x+4)^2(x-2)(x-6)^2$$

$$-324 = a(-3+4)^2(-3-2)(-3-6)^2$$

$$-324 = a(1)(-5)(81)$$

$$-324 = -405a$$

$$a = 0.8$$

$$y = 0.8(x+4)^2(x-2)(x-6)^2$$

$$y = 0.8(0+4)^2(0-2)(0-6)^2$$

$$y = 0.8(16)(-2)(36)$$

$$y = -921.6$$

y-int.
(0, -921.6)