Math III Finding Zeroes of Polynomials and Sketching a Possible Graph

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

-12, -4, 3, -1

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

$\boxed{x=0}$

$x-4=0$

$\boxed{x=4}$

$x+3=0$

$\boxed{x=-3}$

y-int

$(0)^3 - (0)^2 - 12(0) = 0$

* $y = x^3 - x^2 - 12x$

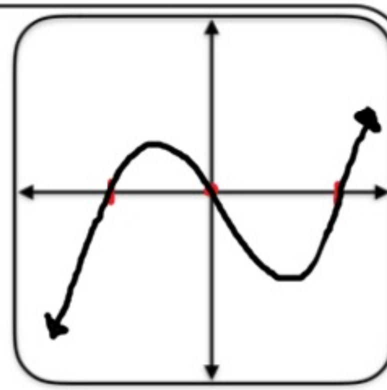
The ***x-intercepts*** of the polynomial are: (0,0) (4,0) (-3,0)

The ***y-intercept*** of the polynomial is: (0,0)

The ***end behavior*** of the polynomial is

if $x \to \infty$ then $y \to$ ∞

if $x \to -\infty$ then $y \to$ $-\infty$



How are the two graphs on this page *similar* and *different*?

* $y = x^4 - x^3 - 12x^2$

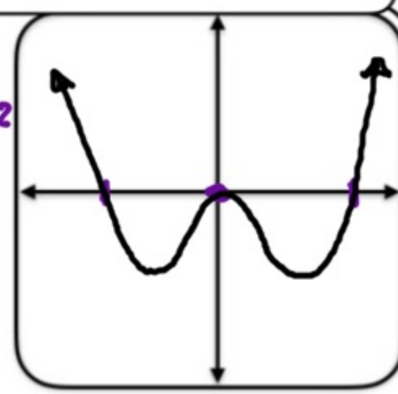
The ***x-intercepts*** of the polynomial are: (4,0) (-3,0) (0,0) mul 2

The ***y-intercept*** of the polynomial is: (0,0)

The ***end behavior*** of the polynomial is

if $x \to \infty$ then $y \to$ ∞

if $x \to -\infty$ then $y \to$ ∞



$x^4 - x^3 - 12x^2$

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

-12, -4, 3, -1

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

$x^2 = 0$

$\boxed{x=0;\ \text{mult } 2}$

$x-4=0$

$\boxed{x=4}$

$x+3=0$

$\boxed{x=-3}$

y-int

$(0)^4 - (0)^3 - 12(0)^2$

(0,0)

Math III Finding Zeroes of Polynomials and Sketching a Possible Graph

$-2x^4 + 6x^3$

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

$\frac{-2x^3}{-2} = \frac{0}{-2}$

$x^3 = 0$

$\boxed{x = 0 \text{ mult } 3}$

$x - 3 = 0$

$\boxed{x = 3}$

y-int

$-2(0)^4 + 6(0)^3$

$(0,0)$

* $y = -2x^4 + 6x^3$

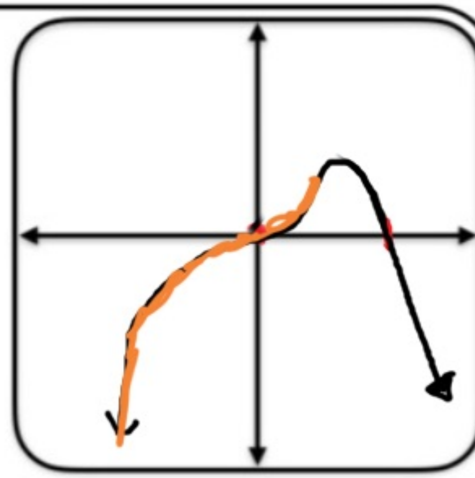
The ***x-intercepts*** of the polynomial are: $(0,0)$ $(3,0)$

The ***y-intercept*** of the polynomial is: $(0,0)$

The ***end behavior*** of the polynomial is

if $x \to \infty$ then $y \to$ $-\infty$

if $x \to -\infty$ then $y \to$ $-\infty$



How are the two graphs on this page *similar* and *different*?

* $y = -2x^3 + 6x^2$

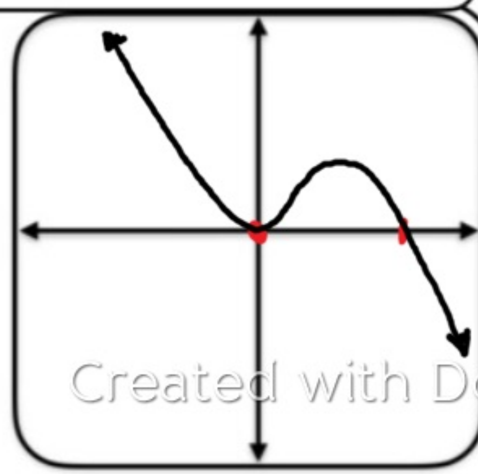
The ***x-intercepts*** of the polynomial are: $(0,0)$ $(3,0)$

The ***y-intercept*** of the polynomial is: $(0,0)$

The ***end behavior*** of the polynomial is

if $x \to \infty$ then $y \to$ $-\infty$

if $x \to -\infty$ then $y \to$ ∞



$-2x^3 + 6x^2$

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

$\frac{-2x^2}{-2} = \frac{0}{-2}$

$x^2 = 0$

$\boxed{x = 0; \text{ mult } 2}$

$x - 3 = 0$

$\boxed{x = 3}$

y-int

$-2(0)^3 + 6(0)^2$

$(0,0)$

Math III Finding Zeroes of Polynomials and Sketching a Possible Graph

$x^5 - 9x^3$

$x^3(x^2 - 9)$

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

$x^3(x+3)(x-3)$

$x^3 = 0$

$\boxed{x = 0 \text{ mult } 3}$

$x + 3 = 0$

$\boxed{x = -3}$

$x - 3 = 0$

$\boxed{x = 3}$

$y = x^5 - 9x^3$

The ***x-intercepts*** of the polynomial are: $(-3,0)\ (3,0)\ (0,0)$

The ***y-intercept*** of the polynomial is: ______

The ***end behavior*** of the polynomial is

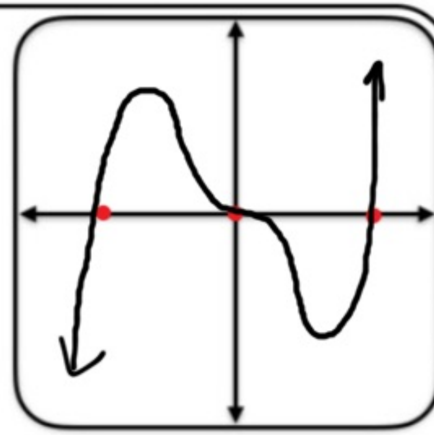
if $x \to \infty$ then $y \to$ ∞

if $x \to -\infty$ then $y \to$ $-\infty$

$x^2 - 9$

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

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



$y = x^6 - 15x^4$

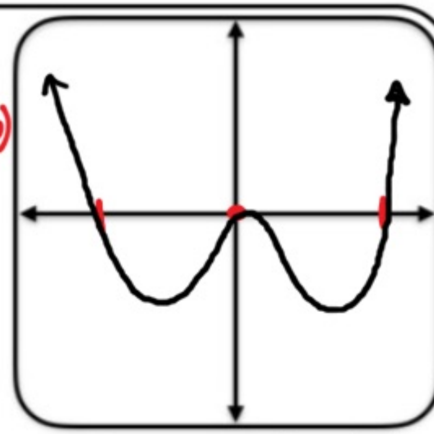
The ***x-intercepts*** of the polynomial are: $(0,0)\ (3.87,0)\ (-3.87,0)$

The ***y-intercept*** of the polynomial is: $(0,0)$

The ***end behavior*** of the polynomial is

if $x \to \infty$ then $y \to$ ∞

if $x \to -\infty$ then $y \to$ ∞



$x^6 - 15x^4$

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

$x^4 = 0$

$\boxed{x = 0 \text{ mult } 4}$

$x^2 - 15 = 0$

$\quad +15 \quad +15$

$\sqrt{x^2} = \sqrt{15}$

$x = \pm\sqrt{15}$

$x = 3.87$

$x = -3.87$

Math III   Finding Zeroes of Polynomials and Sketching a Possible Graph

$x^3 - 4x^2 - 6x$

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

$\boxed{x=0}$

$$\frac{-(-4) \pm \sqrt{(-4)^2 - 4(1)(-6)}}{2(1)}$$

$$\frac{4 \pm \sqrt{16+24}}{2}$$

$$\frac{4 \pm \sqrt{40}}{2}$$

$\sqrt{40}$ → $10 \cdot 4$ → $2\sqrt{10}$

$$\frac{4 \pm 2\sqrt{10}}{2}$$

$2 \pm \sqrt{10}$

$\boxed{x = 5.16}$ $\boxed{x = -1.16}$

* $y = x^3 - 4x^2 - 6x$

The ***x-intercepts*** of the polynomial are: (0,0) (5.16,0) (-1.16,0)

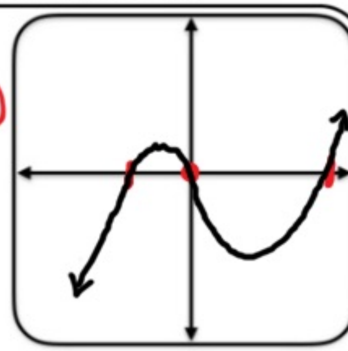
The ***y-intercept*** of the polynomial is: (0,0)

The ***end behavior*** of the polynomial is

if $x \to \infty$ then $y \to$ ∞

if $x \to -\infty$ then $y \to$ $-\infty$

$$\frac{-B \pm \sqrt{B^2 - 4(A)(C)}}{2(A)}$$



How are the two graphs on this page *similar* and *different*?

$y = x^6 - 4x^5 - 6x^4$

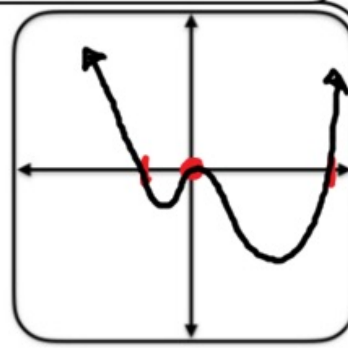
The ***x-intercepts*** of the polynomial are: (0,0) (5.16,0) (-1.16)

The ***y-intercept*** of the polynomial is: (0,0)

The ***end behavior*** of the polynomial is

if $x \to \infty$ then $y \to$ ∞

if $x \to -\infty$ then $y \to$ ∞



$x^6 - 4x^5 - 6x^4$

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

$x^4 = 0$

$\boxed{x = 0 \text{ mult } 4}$

$$\frac{-(-4) \pm \sqrt{(-4)^2 - 4(1)(-6)}}{2(1)}$$

$$\frac{4 \pm \sqrt{16+24}}{2}$$

$$\frac{4 \pm \sqrt{40}}{2} \rightarrow \frac{4 \pm 2\sqrt{10}}{2}$$

$2 \pm \sqrt{10}$

$\boxed{x = 5.16}$ $\boxed{x = -1.16}$