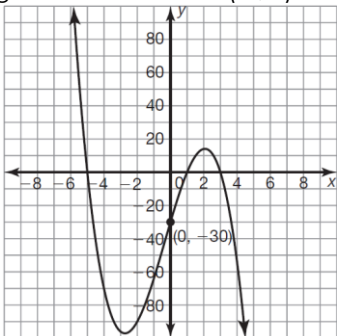


Average Rate of Change

Formula:

Example: Find the average rate of change over the interval $(-4, 3)$.**Polynomial Long Division**

Example: Write the dividend as the product of the quotient and the divisor.

$$(2x^3+3x^2+7x+5) \div (2x+1)$$

Synthetic Division

Example: Write the dividend as the product of the quotient and the divisor.

$$(x^3 - 9x^2 + 8x + 60) \div (x - 5)$$

$$(4x^3 - 5x - 12) \div (2x + 1)$$

Factoring

$$a^2 - b^2 = \underline{\hspace{2cm}}$$

$$a^3 - b^3 = \underline{\hspace{2cm}}$$

$$a^3 + b^3 = \underline{\hspace{2cm}}$$

Example: Factor.

a. $25x^4 - 30x^2 - 7$

b. $x^3 + 2x^2 - 9x - 18$

c. $27x^3 - 64$

Notations

$$(\underline{\hspace{2cm}}) \div (\underline{\hspace{2cm}}) = \underline{\hspace{2cm}}$$

OR

$$\underline{\hspace{2cm}} = (\underline{\hspace{2cm}})(\underline{\hspace{2cm}})$$

If the factor is $2x-1$, the root is $\underline{\hspace{2cm}}$.If the root is 5, the factor is $\underline{\hspace{2cm}}$.

A factor is a factor of a polynomial if ...

Remainder or Factor TheoremExample: Determine whether $(x+3)$ is a factor of $f(x)=2x^3 - x^2 - 3x+9$ and explain.**Rational Root Theorem**Possible: $\underline{\hspace{2cm}}$ Actual: $\underline{\hspace{2cm}}$

Example: Find all of the POSSIBLE rational roots of the equation.

$$3x^4 - 5x^3 + 7x - 15 = 0$$

How can you find out which of the POSSIBLE roots are ACTUAL roots?

Polynomial Equation Word Problem

Amazon is trying to decide on the new size for their delivery boxes. They need the boxes to have a volume of 135 in^3 . The width of this new box needs to be 3 inches longer than twice the length and the height needs to be 2 inches shorter than the length. Find the dimensions of the box.