Long Division

Review: Long Division

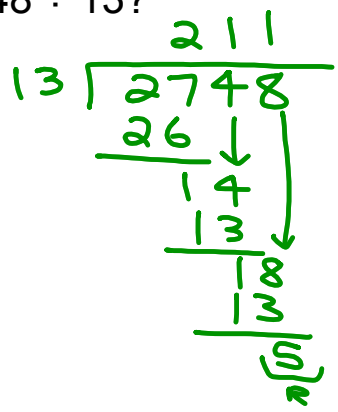
Ex. 425 ÷ 25 = ?

dividend divisor

The following video is included in the content for this lesson. Check it out for a review of middle school long division.

http://www.mathsisfun.com/numbers/long-division-animation.html

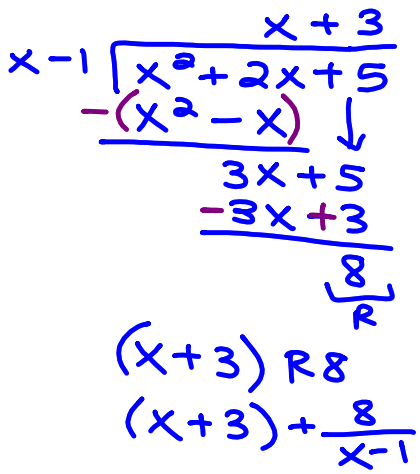
How about 2748 ÷ 13?



Answer
211 R 5

Long division can also be used to divide a polynomial by a binomial.

Ex. Divide $x^2 + 2x + 5$ by $x - 1$



(x + 3) R 8

$(x+3) + \frac{8}{x-1}$

Ex. Divide $5x^3 + 10x - 13x^2 - 9$ by $x - 2$

Note: Must write the polynomial in descending order!

$$5x^2 - 3x + 4$$
$$x-2 \;\big|\; 5x^3 - 13x^2 + 10x - 9$$
$$-5x^3 + 10x^2$$
$$-3x^2 + 10x$$
$$+3x^2 - 6x$$
$$4x - 9$$
$$-4x + 8$$
$$-1 \quad R$$

$$(5x^3 - 13x^2 + 10x - 9) \div (x-2) = (5x^2 - 3x + 4) \frac{-1}{x-2}$$

Ex. Divide: $P(x) = -4x^4 + 2x^2 - x - 3$ by $x - 3$

$0x^3$

$$-4x^3 - 12x^2 - 34x - 103$$
$$x-3 \;\big|\; -4x^4 + 0x^3 + 2x^2 - x - 3$$
$$-4x^4 + 12x^3$$
$$-12x^3 + 2x^2$$
$$-12x^3 + 36x^2$$
$$-34x^2 - x$$
$$-3x^2 + 102x$$
$$-103x - 3$$
$$-103x + 309$$
$$-312$$

$$\frac{P(x)}{(x-3)} = -4x^3 - 12x^2 - 34x - 103 \frac{-312}{(x-3)}$$