

Essential Question: How do we divide polynomials?

Do Now:

Find the area of a triangular garden whose dimensions are $x + 4$ and $2x - 1$. ($A = \frac{bh}{2}$)

$$A = \frac{(x+4)(2x-1)}{2} = \frac{2x^2 + 7x - 4}{2}$$

$x^2 + 3.5x - 2$ units²

Dividing Polynomials: Divide each term of the polynomial by the denominator.

Divide and express in standard form.

1) $\frac{20x^2 + 10x}{5x}$

check: $5x(4x+2) = 20x^2 + 10x$ ✓

3) $6x^3 + 4x^2 + 2x$ divided by $-2x$

check: $-2x(-3x^2 - 2x - 1) = 6x^3 + 4x^2 + 2x$ ✓

5) $(20x^2 + 12x) \div 4x = 5x + 3$

*6) $(b^2 - 12b + 5) \div 2b$

$\frac{1}{2}b - 6 + \frac{5}{2b}$

no decimals in a fraction
can't have $\frac{b}{2.5}$

$10m - 4 + 2m^{-1}$
 $10m - 4 + \frac{2}{m}$

*4) $\frac{20m^2 - 8m + 4}{2m}$

check: $4x(-4x^2 + 2x + 1) = -16x^3 + 8x^2 + 4x$ ✓

$$7) (8r^2 + 5r - 20) \div 4r$$

$$2r + \frac{4}{5} - \frac{1}{5}$$

$$8) \frac{12p^3r^2 + 18p^2r - 6pr}{6p^2r}$$

not a polynomial expression (can't have a variable in the denominator)
 $2pr + 3 - p^{-1}$
 $2pr + 3 - \frac{1}{p}$

9) The volume of a rectangular pyramid is one-third the product of the area of its base and its height. Find an expression for the volume of a rectangular pyramid whose base has an area of $3x^2 + 12x + 9$ square feet and whose height is $x + 3$ feet.

$B =$ area of a base

$$V = \frac{1}{3} Bh$$

$$V = \frac{1}{3} (3x^2 + 12x + 9) (x + 3)$$

$$V = (x^2 + 4x + 3) (x + 3)$$

$$V = x^3 + 4x^2 + 3x + 3x^2 + 12x + 9$$

$$= x^3 + 7x^2 + 15x + 9$$