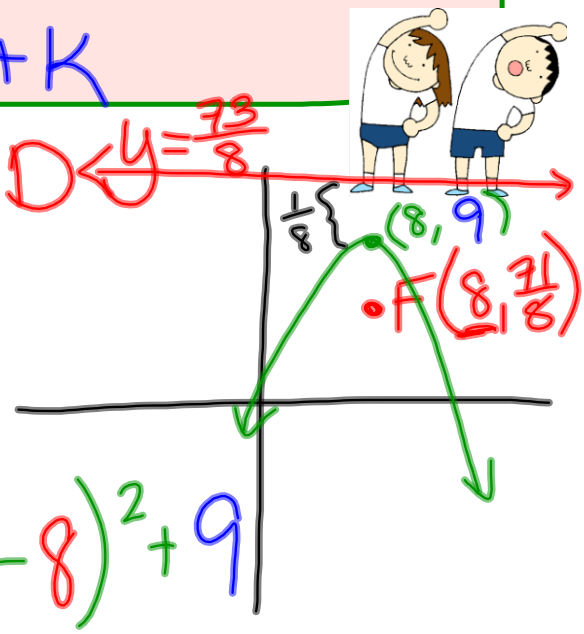
Warm Up: Given directrix $y = \frac{73}{8}$, and focus $\left(8, \frac{71}{8}\right)$, write the equation of the quadratic in ~~BOTH~~ vertex and standard form.

$y = \frac{1}{4p}(x-h)^2 + k$

p = dist from
- vertex to focus
- vertex to directrix

(h, k) = vertex



73/8 → 9.125
Ans+8.875 → 18
Ans/2 → 9

$\frac{-1}{4(1/8)}$ → -2

$y = \frac{-1}{4(\frac{1}{8})}(x-8)^2 + 9$

$y = -2(x-8)^2 + 9$

Long Division of Polynomials

...remember long division from elementary school?

$$5\overline{)128}$$

x25 R3

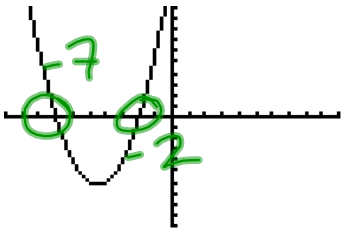
−10↓

28

−25

3

$25\frac{3}{5}$



...now how about with dividing polynomials?

$$\left(x^2+9x+14\right)/\left(x+7\right)$$

$$\frac{(x^2+9x+14)}{(x+7)} = \frac{(x+2)(x+7)}{x+7} = x+2$$

But, what if you can't factor it and cancel common factors???

Example:

$(3x^3 - 5x^2 + 10x - 3)/(3x+1)$

x^2-2x+4 R -7

$3x+1 \overline{)3x^3-5x^2+10x-3}$

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

$-6x^2+10x$

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

$12x-3$

$-12x+4$

-7

$x^2-2x+4-\frac{7}{3x+1}$

3x+1 isn't a factor, there's a remainder

Procedure:

① Rewrite as long division (LD) (*denom. outside of box)

② Find what you have to multiply the FIRST term outside by to get the first term inside (distribute that to each term outside)

③ Subtract Result & bring down next term

④ Repeat 2-3 until there's no more terms

Regents Question 6/2016:

The expression $\frac{4x^3 + 5x + 10}{2x + 3}$ is equivalent to:

1) $2x^2 + 3x - 7 + \frac{31}{2x+3}$

2) $2x^2 - 3x + 7 - \frac{11}{2x+3}$

3) $2x^2 + 2.5x + 5 + \frac{15}{2x+3}$

4) $2x^2 - 2.5x - 5 - \frac{20}{2x+3}$

$2x^2 - 3x + 7 - \frac{11}{2x+3}$

$2x+3 \overline{)\, 4x^3 + 0x^2 + 5x + 10}$

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

$-6x^2 + 5x$

$+6x^2 + 9x$

$14x + 10$

$-14x + 21$

-11

Name: _____

SoftSchools

Polynomial Long Division.

1) $(6a^2 + 7a - 10) \div (a + 1)$

2) $(7m^2 + 10m - 15) \div (m + 8)$

3) $(7a^2 - 20a + 24) \div (a - 3)$

4) $(8b^2 + 10b - 12) \div (b + 2)$

5) $(6z^2 - 8z + 10) \div (z - 2)$

6) $(8c^2 - 14c + 31) \div (c - 2)$

7) $(10c^2 + 12c - 15) \div (c + 3)$

8) $(5y^2 + 8y - 11) \div (y + 7)$

9) $(9n^2 + 11n - 16) \div (n + 9)$

10) $(5n^3 - 20n^2 + 24n - 76) \div (n - 10)$

11) $(7m^4 + 16m^3 - 19m - 46) \div (m + 5)$

12) $(x^4 + 11x^3 - 16x - 40) \div (x + 2)$

13) $(4c^4 + 10c^3 - 14c - 32) \div (c + 11)$

14) $(7n^4 - 6n^3 + 13n^2 - 6n) \div (n - 6)$

15) $(10a^4 + 19a^3 - 22a - 49) \div (a + 9)$

16) $(12z^4 - 10z^3 + 18z^2 - 6z - 12) \div (z - 7)$

17) $(7c^4 - 4c^3 + 11c^2 - 8c - 8) \div (c - 3)$

18) $(8n^4 - 3n^3 + 8n^2 - 3n - 6) \div (n - 9)$

19) $(4q^4 - 4q^3 + 20q^2 - 5q) \div (q - 10)$

20) $(11y^4 - 8y^3 + 16y^2 - 10y - 11) \div (y - 6)$