(6)

$$(c-2)\overline{)\,8c^2-14c+31}$$

$8c+2+\frac{35}{c-2}$

$-(8c^2+16c)$ ↓

$2c+31$

$-(2c+4)$

35

(10)

$$5n^2+30n+324+\frac{3164}{n-10}$$

$$(n-10)\overline{)5n^3-20n^2+24n-76}$$

$$-(5n^3-50n^2)$$

$$30n^2+24n$$

$$-(30n^2-300n)$$

$$324n-76$$

$$-(324n-3240)$$

$$3164$$

I can Divide Polynomials using Synthetic Division

Long Division!!!!

TRY IT:

$(x^3-2x^2+x-6)\div(x-3)$

$x^2+x+4+\frac{6}{x-3}$

$(x-3)\overline{)x^3-2x^2+x-6}$

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

$1x^2+x$

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

$4x-6$

$-(4x-12)$

6

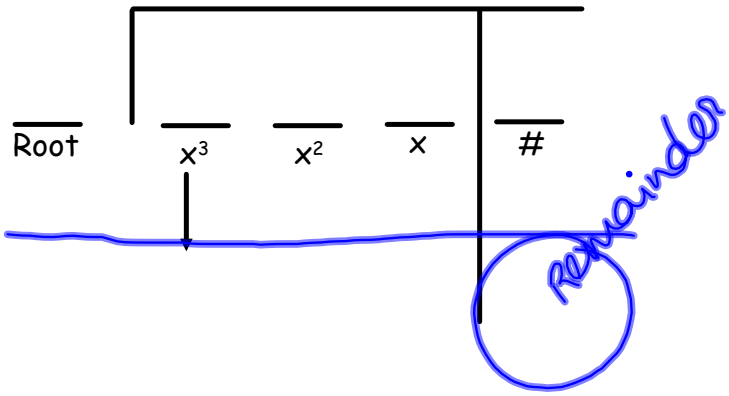
I can Divide Polynomials using Synthetic Division

Synthetic Division.

Synthetic Division is

Synthetic Division:

1. Draw a long division symbol. #s in front of variables
2. Use only the coefficients of all terms in the numerator.
   (Look out for missing terms)
3. Take the root (opposite sign from denominator) and place it on the outside
   negation
4. Always bring down the first #
5. From here on out it is only multiplication and addition.
   only works for binomials w/ leading coefficient =1



I can Divide Polynomials using Synthetic Division

here is the same problem again:

TRY IT:

$(1x^3 - 2x^2 + 1x - 6) \div (x - 3)$ Root: 3

3	1	-2	1	-6
Root	x^3	x^2	x	#
	↓	3	3	12
	$1x^2$	$+1x$	$+4$	$+\frac{6}{x-3}$

take the degree down one

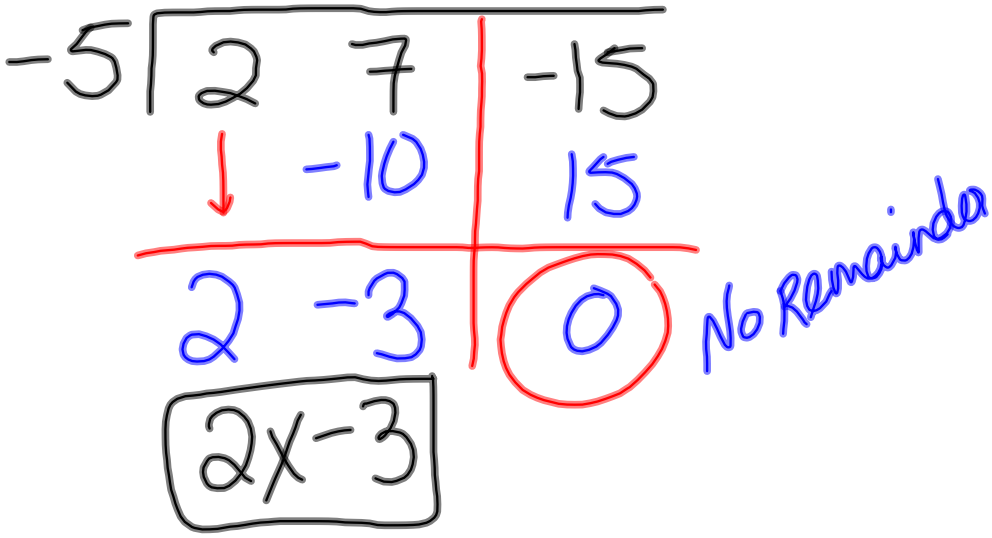
That's great, but I still don't get what these #'s mean...where is my answer?

I can Divide Polynomials using Synthetic Division

Still not quite sure about this synthetic division stuff? Let's try an easier one...

$(2x^2+7x-15) \div (x+5)$ Root: -5

$(x+5)$ is a Factor



I can Divide Polynomials using Synthetic Division

Look at this guy:

What do you do since there are no x^2 or x?

$(x^3-8) \div (x-2)$ Root: 2

(x^3+0x^2+0x-8)

2	1	0	0	-8
	↓	2	4	8
	1	2	4	0

x^2+2x+4

Check:

$(x^2+2x+4)(x-2) = x^3-8$

Given $f(x) = 3x^2 + 7x - 20$ and $g(x) = x - 2$, state the quotient and remainder of $\frac{f(x)}{g(x)}$, in the form $q(x) + \frac{r(x)}{g(x)}$.

Root: 2

X	Y1
0	-20
1	-10
2	6
3	28
4	56
5	90
6	130

Press + for ΔTbl

2	3	7	-20
	↓	6	26
	3	13	6

$3x + 13 + \frac{6}{x-2}$

I can Divide Polynomials using Synthetic Division

Give this one a try on your own. Look at the steps in your notebook and follow them!!!

$(x^5 + 2x^3 - 7x - 78) \div (x - 3)$

YOU TRY:

Using any method of your choice, show that $x - 2$ is a factor of $6x^3 - 19x^2 + 16x - 4$.

① LD ② SD ③ f(2) (2,0)

alg OR calc

2	6	-19	16	-4
	↓	12	-14	4
	6	-7	2	0

It's a factor b/c there's no Remainder

REGENTS QUESTION 6/2016

Determine if $x - 5$ is a factor of $2x^3 - 4x^2 - 7x - 10$. Explain your answer.

I can Divide Polynomials using Synthetic Division

Give this one a try on your own. Don't forget to have a # for every "place holder."

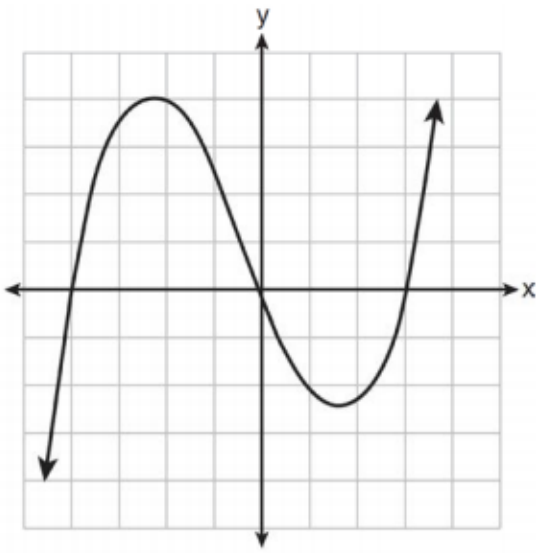
$(x^2 - 9) \div (x + 7)$

Which expression is equivalent to $\frac{2x^4+8x^3-25x^2-6x+14}{x+6}$?

1) $2x^3+4x^2+x-12+\frac{86}{x+6}$
2) $2x^3-4x^2-x+14$
3) $2x^3-4x^2-x+\frac{14}{x+6}$
4) $2x^3-4x^2-x$

REGENTS

The graph of $p(x)$ is shown below.



What is the remainder when $p(x)$ is divided by $x+4$?

1) $x-4$
2) -4
3) 0
4) 4

Given $r(x) = x^3 - 4x^2 + 4x - 6$, find the value of $r(2)$. What does your answer tell you about $x - 2$ as a factor of $r(x)$? Explain.

If $p(x) = 2x^3 - 3x + 5$, what is the remainder of $p(x) \div (x - 5)$?

1) -230
2) 0
3) 40
4) 240

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