6-5 Polynomial Division / Synthetic Division

Alg2 std. 3.0

$$16\overline{)2913}$$

$182\frac{1}{16}$

-16

131

-128

33

32

1

Polynomial (Long) Division

ex. 1 $(2x^3 + 9x^2 - 13x + 30) \div (x+6)$

dividend, divisor

$2x^2 - 3x + 5 \leftarrow$ quotient

$x+6\overline{)2x^3+9x^2-13x+30}$

$-(2x^3+12x^2)$

$-3x^2-13x$

$-(-3x^2-18x)$

$5x+30$

$-(5x+30)$

0

ex. 2 $(y^4 + 2y^2 - y + 1) \div (y^2 - y + 1)$

$y^2 + y + 2 - \frac{1}{y^2-y+1}$

$y^2-y+1\overline{)y^4+0y^3+2y^2-y+1}$

$-(y^4 - y^3 + y^2)$

$y^3 + y^2 - y$

$-(y^3 - y^2 + y)$

$2y^2 - 2y + 1$

$-(2y^2 - 2y + 2)$

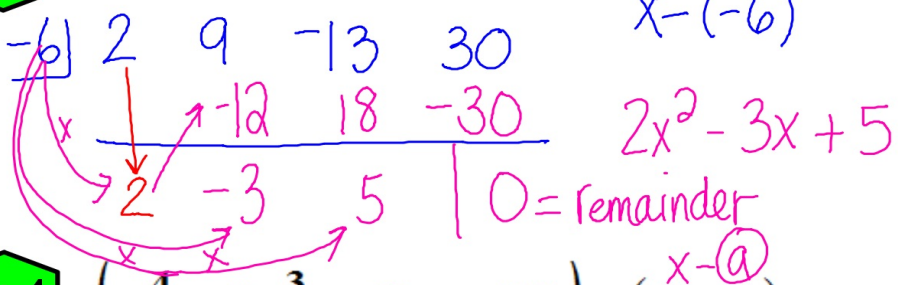
-1

Synthetic Division

$x - a$

ex. 3 $(2x^3 + 9x^2 - 13x + 30) \div (x+6)$

$x-(-6)$

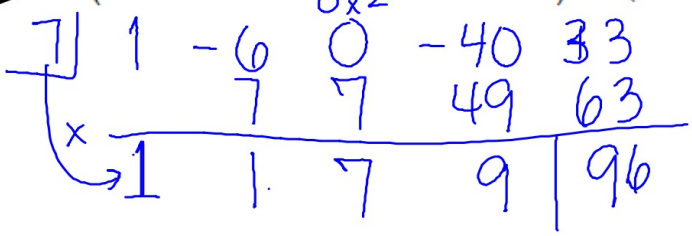


$2x^2 - 3x + 5$

ex. 4 $(x^4 - 6x^3 - 40x + 33) \div (x-7)$

$x-a$

$0x^2$



$x^3 + x^2 + 7x + 9 + \frac{96}{x-7}$