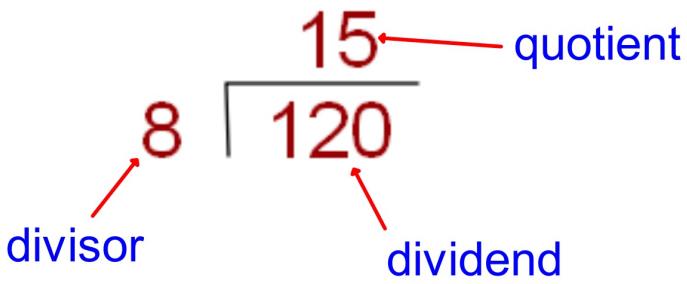
Vocabulary for division:



Find this quotient without a calculator. $\frac{51638}{23}$ =

- "goes into"
  23 goes into 51 twice
- "multiply"
  multiply 2 and 23 = 46
- "subtract"
  51 - 46 = 5
- "bring down"
  bring down the 6

$$23 \overline{)\,51638} \quad 2245 \text{ R}=3$$

46
56
46
103
92
118
115
3

Repeat these steps until you are finished.

Writing remainders:

$\frac{51638}{23} = 2245$ R=3 OR $\frac{51638}{23} = 2245 + \frac{3}{23}$

OR $\frac{51638}{23} = 2245.13$

It won't be possible to leave the remainder this way when doing polynomial long division.

Polynomial Long Division:

$$\frac{x^2 + 9x + 20}{x + 4} = x + 4 \overline{)\,x^2 + 9x + 20}$$

$x + 5$

$-\,(x^2 + 4x)$

$5x + 20$

$-\,(5x + 20)$

0

When there is no remainder then both the divisor and the quotient are factors of the dividend.

Find each quotient. Give remainder in any form.

$$\frac{6x^3 - x^2 - 30x + 19}{2x + 5} = 3x^2 - 8x + 5 \quad R = -6$$

$$2x+5 \;\overline{)\; 6x^3 - x^2 - 30x + 19}$$

$3x^2 - 8x + 5 \quad R = -6$

$-(6x^3 + 15x^2)$

$-16x^2 - 30x$

$-(-16x^2 - 40x)$

$10x + 19$

$-(10x + 25)$

-6

$$\frac{21x^3 - 14x^2 + 24x - 16}{3x - 2} = 7x^2 + 8$$

$$3x-2 \;\overline{)\; 21x^3 - 14x^2 + 24x - 16}$$

$7x^2 \quad +8$

$-(21x^3 - 14x^2)$

$+24x - 16$

$-(24x - 16)$

0

Find this Quotient.

$$\frac{3x^4 - 17x^3 + 13x^2 + 76x - 105}{x^2 - 6x + 10} = 3x^2 + x - 11 \quad R = 5$$

$$x^2-6x+10 \;\overline{)\; 3x^4 - 17x^3 + 13x^2 + 76x - 105}$$

$3x^2 + x - 11 \quad R = 5$

$-(3x^4 - 18x^3 + 30x^2)$

$-x^3 - 17x^2 + 76x$

$-(-x^3 - 6x^2 + 10x)$

$-11x^2 + 66x - 105$

$-(-11x^2 + 66x - 110)$

5