Converting between measurements

1 ft = 0.305 m

1 ft = 12 inches

Ex: 36 in. = X ft

36 in = 3 ft

* Proportions

$\frac{a}{c} = \frac{b}{f}$

$\frac{4}{6} = \frac{2}{3}$

* Cross Multiply

Q: How can we set this up as a proportion?

1 ft = 12 in → "12 in. per 1 ft" → $\frac{12 \text{ in.}}{1 \text{ ft.}}$

36 in = X ft

X ft = 36 in → "36 in per X ft" → $\frac{36 \text{ in.}}{X \text{ ft.}}$

$\frac{12}{1} \times \frac{36}{X}$ $\quad 12 \cdot X = 36 \cdot 1$ "Cross multiply to solve for X"

$\frac{12X}{12} = \frac{36}{12}$

$\frac{1}{12} \times \frac{X}{36}$ $\quad X = 3$

$\frac{12}{1} = \frac{36}{X}$ $\quad 12 = \frac{36}{X}$

$\frac{1}{12} = \frac{X}{36}$ $\quad 12 = \frac{36}{1} \cdot \frac{1}{X} = \frac{36}{X}$

$X \cdot 12 = 36 \cdot \frac{1}{X} \cdot X$ Multiply both sides by X

$\frac{12X}{12} = \frac{36}{12}$ $\quad \frac{1}{X} \cdot X = \frac{X}{X} = 1$

$X = 3$

$X \cdot 12 = \frac{36}{X}$

Convert 37 ft to meters

1 ft = 0.305 m

(?) $\frac{37}{0.305} = 121.3$ $\frac{ft}{meters}$ 37 ft per 0.305 m is 121.3

$\frac{0.305\,m}{1\,ft} = \frac{X\,m}{37\,ft}$

$37 \cdot 0.305 = X \cdot 1 = X$

$11.285 = X$

Multiplying Polynomials → "Simplify the Expression"

$(2X-3)(3X+3) = 6X^2 + 6X - 9X - 9$

$= 6X^2 - 3X - 9$

"Distribute 2x-3 to 3x+3"
- Using multiplication
- To each term

First term : 2X

$2X \cdot 3X = 2 \cdot X \cdot 3 \cdot X$
$= 2 \cdot 3 \cdot X \cdot X$
$= 6 \cdot X \cdot X$
$= 6 \cdot X^1 \cdot X^1$
$= 6X^{1+1}$
$= 6X^2$

$2X \cdot 3 = 2 \cdot 3 \cdot X = 6X$

$-3 \cdot 3X = -9 \cdot X = -9X$

$-3 \cdot 3 = -9$

$6X - 9X = -3X$

* Distributive prop.
* Exponents
  - Rules for adding exponents
* Combining like terms

$-(2X+3)$

$-1 \cdot 2X + (-1) \cdot 3$

$= -2X - 3$

$X' = X$

$X \cdot X = X^1 \cdot X^1$
$= X^2$

"When mult. the same variables, we can add their exponents"

$X^2 \cdot X^7 = X^{2+7}$
$= X^9$

Simplify the exp.

$(3X-3Y)(2X+Y)$

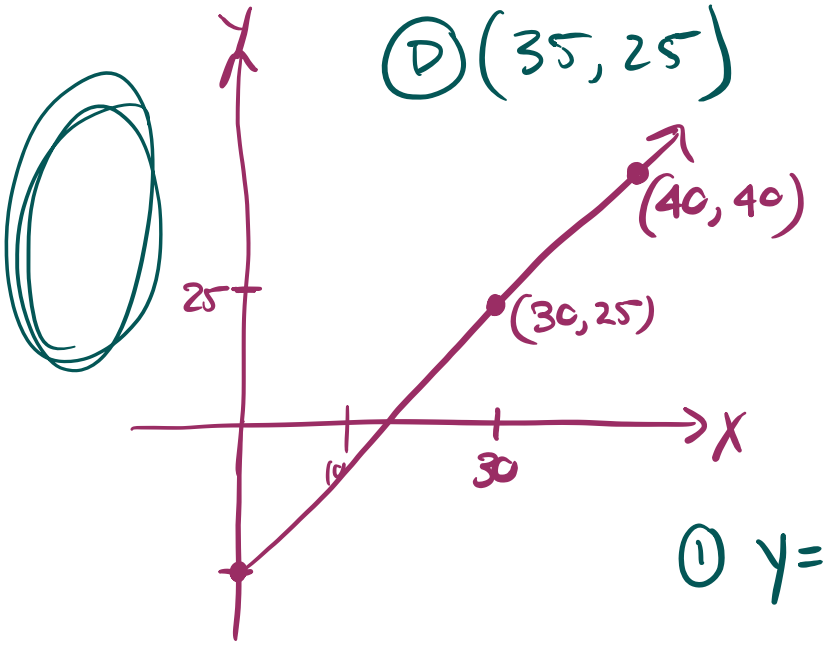
$5^0 = 1$, $2^0 = 1 \implies x^0 = 1$

"placeholder"

$5^1 = 5 = 5 \cdot 1 = 5$

$5^2 = 5 \cdot 5 = 25 = 25 \cdot 1 = 25$

$\vdots$



Ⓓ (35, 25)

- Which point is also on the line?

~~Ⓐ (-20, 15)~~

~~Ⓑ (-10, 5)~~

① $y = mx + b$ Ⓒ (-15, -30)

$b = -20$

m: slope $= \dfrac{y_2 - y_1}{x_2 - x_1}$

② pt 1: $(x_1, y_1) = (30, 25)$

pt 2: $(x_2, y_2) = (40, 40)$

③ $\frac{y_2 - y_1}{x_2 - x_1} = \frac{40-25}{40-30} = \frac{15}{10} = \frac{3}{2} = m$

④ $y = \frac{3}{2}x - 20$

$16 \div 5 = 3R1$

$3 \cdot 5 = 15$
difference → subtract

$16 \div \frac{5}{2}$

"flip the fraction and multiply"

$\frac{16}{1} \cdot \frac{2}{5} = \frac{32}{5} = 30R2$

$6 \cdot 5 = 30$
R2

$16 \div 5 = \frac{16}{5} = 5\overline{)16}$

"16 divided by 5"

$5 \times \square \leq 16$

$5 \times 3 = 15$

$16 - 15 = 1$

$16 \div 5 = 3$ remainder 1

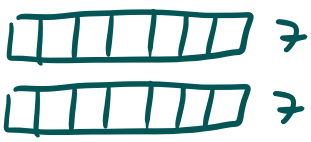
$12 \div 7 = ?$

$12 \div 7 = 1\text{R}$

$7 \times 1 = 7$

~~$7 \times 2 = 14$~~

$12 - 7 = 5$



$6 \div 4 =$

$8 \div 3 =$

$9 \div 2 =$