2.6 Getting The Slope Of A Line From Its' Equation

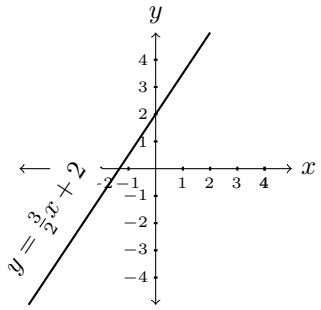
For this, first you need to express the line in *'slope-intercept'* form, $y = mx + c$.

The coefficient of y must equal 1, so that we can read what our value of slope, 'm', is, directly from the equation.[v]

EXAMPLE:
Find the slopes of the following lines: (i) $2y = 3x+4$, (ii) $2x+3y = 7$, (iii) $y = \pi x+1$.

(i)
We express the equation in the form $y = mx + c$. *The coefficient of y must be* 1.

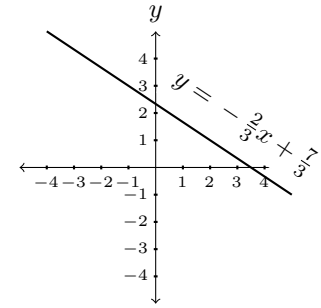
$$\begin{aligned} & 2y = 3x + 4 \\ \implies & \frac{2y}{2} = \frac{3x+4}{2} \quad \ldots \text{ (dividing both sides by 2.)} \\ \implies & y = \frac{3}{2}x + \frac{4}{2} \\ \implies & y = \frac{3}{2}x + 2 \end{aligned}$$



• Reading directly from the equation gives slope, $m = \frac{3}{2}$

(ii)
We express the equation in the form $y = mx + c$. *The coefficient of y must be* 1.

$$\begin{aligned} & 2x + 3y = 7 \\ \implies & 3y = -2x + 7 \quad \ldots \text{ (subtracting } 2x \text{ from both sides.)} \\ \implies & \frac{3y}{3} = \frac{-2x+7}{3} \quad \ldots \text{ (dividing both sides by 3.)} \\ \implies & y = -\frac{2}{3}x + \frac{7}{3} \end{aligned}$$



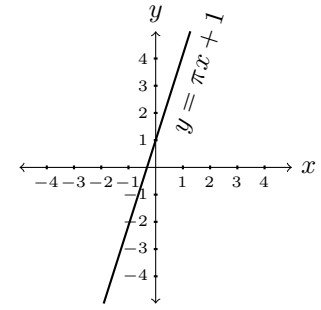
• Reading directly from the equation gives slope, $m = -\frac{2}{3}$

(iii)
We express the equation in the form $y = mx + c$. *The coefficient of y must be* 1.

$y = \pi x + 1$

The line is already in the form $y = mx + c$.

We need do nothing else other than just read off its' slope. This is an example of a line with its' slope as an *'irrational'* number. (See how it is graphed. You might visually estimate the slope as m=3.14 - which approximately equals π.)



• Reading directly from the equation gives slope, $m = \pi$

[v] Remember, it's $\boldsymbol{y} = mx + c$, *not* "$2y = mx + c$". In that case, we would have forgotten to divide the value of the slope by 2 and the answer we would read from the equation would actually be equal to $2m$, twice the slope!