CHAPTER 6 Analyse Linear Relations
6.2 The Equation of a Line in Standard Form: $Ax + By + C = 0$
Converting an Equation of a Line from Standard Form to Slope y-Intercept Form

Example:

a) Change the equation $2x + 5y - 8 = 0$ to slope y-intercept form. Identify the slope and the y-intercept.

b) The amount of fuel F, in litres, remaining the tank of Hartmut's motorcycle after t hours of riding is given by the equation $2F + 3t - 24 = 0$. Determine the fixed and the variable part. Explain their meaning.

Solution:

a)
$$2x + 5y - 8 = 0$$
$$2x + 5y - 8 - 2x + 8 = 0 - 2x + 8$$
$$5y = -2x + 8$$
$$\frac{5y}{5} = \frac{-2x}{5} + \frac{8}{5}$$
$$y = -\frac{2}{5}x + \frac{8}{5}$$

The slope is $-\frac{2}{5}$ and the y-intercept is $\frac{8}{5}$.

b)
$$2F + 3t - 24 = 0$$
$$2F + 3t - 24 - 3t + 24 = 0 - 3t + 24$$
$$2F = -3t + 24$$
$$\frac{2F}{2} = \frac{-3t}{2} + \frac{24}{2}$$
$$F = -\frac{3}{2}t + 12$$

The fixed part is 12 and the variable part is $-\frac{3}{2}$. The motorcycle started with 12 L of fuel and burns 1.5 L of fuel per hour of riding.

Practice:

1. a) Express the equation $-3x + 2y - 4 = 0$ in slope *y*-intercept form. Identify the slope and the *y*-intercept.

b) Raschid is siding a shed and needs some lumber cut to make the boards. The millwright charges a fixed cost for setting up the power saw and a variable cost for each board. The cost *C* for *n* boards is given by the relation $4C - 3n - 20 = 0$. Determine the fixed cost and the variable cost.

Answers:

1. a) $y = \frac{3}{2}x + 2$

The slope is $\frac{3}{2}$, and the *y*-intercept is 2.

b) fixed cost is \$5.00; variable cost is \$0.75.