Exercise 39

Consider the relationship $3r + 2t = 18$.

(a) Write the relationship as a function $r = f(t)$.

(b) Evaluate $f(-3)$.

(c) Solve $f(t) = 2$.

Solution

Solve the relationship for r.

$$3r + 2t = 18$$

$$3r = 18 - 2t$$

$$r = \frac{1}{3}(18 - 2t)$$

$$r = \boxed{f(t) = 6 - \frac{2}{3}t}$$

Evaluate this function at $t = -3$.

$$f(-3) = 6 - \frac{2}{3}(-3) = 6 + 2 = 8 \quad \rightarrow \quad \boxed{f(-3) = 8}$$

Plug in 2 for $f(t)$ and solve the equation for t.

$$2 = 6 - \frac{2}{3}t$$

$$2 - 6 = -\frac{2}{3}t$$

$$-4 = -\frac{2}{3}t$$

Multiply both sides by -3.

$$(-4)(-3) = 2t$$

$$12 = 2t$$

Divide both sides by 2.

$$\boxed{t = 6}$$