Fonctions affines

Exercice 1.

$\boxed{f(x) = \frac{2}{5}x - 2}$

$\boxed{g(x) = -2x + 1}$

$\boxed{f(x) = -\frac{3}{4}x - 1}$

$\boxed{g(x) = 2x - 2}$

Exercice 2.

a) $m = \frac{12 + 28}{-24 - 36} = \frac{40}{-60} = -\frac{2}{3}$

$\Rightarrow \quad y = -\frac{2}{3}x + h$

$A(36; -28) \quad \rightarrow \quad -28 = -24 + h$

$\Leftrightarrow \quad h = -4 \quad \Rightarrow \boxed{f(x) = -\frac{2}{3}x - 4}$

b) $m = \frac{5}{4}$

$C(-4; 3) \quad \Rightarrow \quad 3 = -5 + h$

$\Leftrightarrow \quad h = 8 \quad \Rightarrow \boxed{y = \frac{5}{4}x + 8}$

$m = \frac{8 + 12}{-20 - 30} = \frac{20}{-50} = -\frac{2}{5}$

$\Rightarrow \quad y = -\frac{2}{5}x + h$

$A(30; -12) \quad \rightarrow \quad -12 = -12 + h$

$\Leftrightarrow \quad h = 0 \quad \Rightarrow \boxed{f(x) = -\frac{2}{5}x}$

$m = \frac{3}{5}$

$C(-10; 2) \quad \Rightarrow \quad 2 = -3 + h$

$\Leftrightarrow \quad h = 5 \quad \Rightarrow \boxed{y = \frac{3}{5}x + 5}$

Exercice 3.

a) $C(x) = 0.25x + 95 \qquad R(x) = 1.2x$

$0.25x + 95 = 1.2x \quad \Leftrightarrow \quad 0.95x = 95$

$\Leftrightarrow \boxed{x = 100}$ (seuil de rentabilité)

b) $C'(x) = 0.35x + 68$

$0.35x + 68 = 1.2x \quad \Leftrightarrow \quad 0.85x = 68$

$\Leftrightarrow \boxed{x = 80}$ (seuil de rentabilité)

$C(x) = 0.3x + 80 \qquad R(x) = 1.3x$

$0.3x + 80 = 1.3x \quad \Leftrightarrow \quad x = 80$

$\Leftrightarrow \boxed{x = 80}$ (seuil de rentabilité)

$C'(x) = 0.4x + 63$

$0.4x + 63 = 1.3x \quad \Leftrightarrow \quad 0.9x = 63$

$\Leftrightarrow \boxed{x = 70}$ (seuil de rentabilité)

c) $0.25x + 95 = 0.35x + 68 \quad \Leftrightarrow \quad 0.1x = 27$

$\Leftrightarrow \boxed{x = 270}$

$0.3x + 80 = 0.4x + 63 \quad \Leftrightarrow \quad 0.1x = 17$

$\Leftrightarrow \boxed{x = 170}$

Exercice 4.

a) $(50; 12) \qquad (100; 15)$

$$m = \frac{15 - 12}{100 - 50} = \frac{3}{50}$$

$$\Rightarrow \quad f(x) = \frac{3}{50}x + h$$

$$(100; 15) \quad \rightarrow \quad f(100) = 15$$

$$\Rightarrow \quad \frac{3}{50} \cdot 100 + h = 15 \quad \Rightarrow \quad h = 9$$

$$\Rightarrow \boxed{f(x) = \frac{3}{50}x + 9}$$

$(100; 18) \qquad (150; 21)$

$$m = \frac{21 - 18}{150 - 100} = \frac{3}{50}$$

$$\Rightarrow \quad f(x) = \frac{3}{50}x + h$$

$$(100; 18) \quad \rightarrow \quad f(100) = 18$$

$$\Rightarrow \quad \frac{3}{50} \cdot 100 + h = 18 \quad \Rightarrow \quad h = 12$$

$$\Rightarrow \boxed{f(x) = \frac{3}{50}x + 12}$$

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b) $f(30) = \frac{3}{50} \cdot 30 + 9 = \boxed{10.8 \text{ cm}}$

$f(40) = \frac{3}{50} \cdot 40 + 12 = \boxed{14.4 \text{ cm}}$

Exercice 5.