

Exercice 1

$$1) F = (x-3)^2 + (x-3)(x+4)$$

$$F = (x-3)[x-3+x+4]$$

$$\boxed{F = (x-3)(2x+1)}$$

2.a) G existessi:

$$(x-3)^2 + (x-3)(x+4) \neq 0$$

$$(x-3)(2x+1) \neq 0$$

$$x-3 \neq 0 \text{ et } 2x+1 \neq 0$$

$$x \neq 3 \text{ et } x \neq -\frac{1}{2}$$

b) pour  $x \neq 3$  et  $x \neq -\frac{1}{2}$

$$G = \frac{14x+7}{(x-3)^2 + (x-3)(x+4)}$$

$$G = \frac{7(2x+1)}{(x-3)(2x+1)}$$

$$\boxed{G = \frac{7}{x-3}}$$

c) pour  $x = \sqrt{2}$ , on a:

$$G = \frac{7}{\sqrt{2}-3}$$

$$G = \frac{7(\sqrt{2}+3)}{(\sqrt{2}-3)(\sqrt{2}+3)}$$

$$G = \frac{7(\sqrt{2}+3)}{2-9}$$

$$G = \frac{7(\sqrt{2}+3)}{-7}$$

$$G = -(\sqrt{2}+3)$$

$$\boxed{G = -\sqrt{2}-3}$$

Exercice 2

$$\text{Soit } f(x) = \frac{-x+3}{5}$$

$$1.a) f(x) = -\frac{x}{5} + \frac{3}{5}$$

$$f(x) = -\frac{1}{5}x + \frac{3}{5}$$

on a:  $a = -\frac{1}{5} < 0$  donc

$f$  est décroissante.

b)

$$\text{on a: } f\left(\frac{7}{8}\right) < f\left(\frac{5}{6}\right)$$

$$\text{Car } \frac{7}{8} > \frac{5}{6} \text{ et } f \text{ est}$$

décroissante.

2) Calculons  $x$ .

$$f(x) = -2 \Leftrightarrow -\frac{1}{5}x + \frac{3}{5} = -2$$

$$\Leftrightarrow -\frac{1}{5}x = -2 - \frac{3}{5}$$

$$\Leftrightarrow -\frac{1}{5}x = -\frac{13}{5}$$

$$\Leftrightarrow \frac{1}{5}x = \frac{13}{5}$$

$$\Leftrightarrow x = \frac{13}{5} \times 5$$

$$\boxed{x = 13}$$

### Exercice 3

1) Justification.

B est un carré, et

$$V = \frac{B \times h}{3}$$

$$32 = \frac{B \times 6}{3}$$

$$B \times 6 = 96$$

$$B = \frac{96}{6}$$

$$\boxed{B = 16 \text{ dm}^2}$$

2) Démonstration

on a:  $B = C^2$

$$C = \sqrt{B}$$

$$C = \sqrt{16}$$

$$C = 4 \text{ dm}$$

or:  $k = \frac{C'}{C}$  avec

$$C' = KN = NM = KL = ML \text{ et}$$

$$C = PS = SR = PQ = QR.$$

Alors  $\boxed{k = \frac{3}{4}}$

3) a) Volume  $V'$  de la pyramide OKLMN.

$$V' = k^3 \times V \Leftrightarrow V' = \left(\frac{3}{4}\right)^3 \times 32$$

$$\boxed{V' = 13,5 \text{ dm}^3}$$

b) on a:

$$V = V_b + V'$$

$$V_b = V - V'$$

$$V_b = 32 - 13,5$$

$$\boxed{V_b = 18,5 \text{ dm}^3}$$

4) La quantité de béton  
Suffira pour confectionner  
les 4 bornes car

$$\frac{75}{4} = 18,75 \text{ dm}^3 > 18,5 \text{ dm}^3$$

Conclusion:  $4 V_b = 4 \times 18,5$   
 $4 V_b = 74 \text{ dm}^3$

$$\boxed{4 \times V_b < 75 \text{ dm}^3}$$