DS n°3

Ex1

$A = \frac{25}{7} : \frac{40}{3} = \frac{25}{7} \times \frac{3}{40} = \frac{5 \times 5 \times 3}{7 \times 8 \times 5} = \boxed{\frac{15}{56}}$

$B = \frac{2 - \frac{15}{2}}{3 \times \frac{7}{10}} = \frac{\frac{4}{2} - \frac{15}{2}}{\frac{21}{10}} = \frac{-\frac{11}{2}}{\frac{21}{10}} = -\frac{11}{2} \times \frac{10}{21}$

$= \frac{-11 \times 2 \times 5}{2 \times 21}$

$= \boxed{\frac{-55}{21}}$

$C = \frac{\frac{1}{8} - \frac{3}{10}}{3} = \frac{\frac{1}{2 \times 4} - \frac{3}{5 \times 2}}{3}$

$= \frac{\frac{5}{2 \times 4 \times 5} - \frac{12}{5 \times 2 \times 4}}{3}$

$= \frac{\frac{5 - 12}{40}}{3} = \frac{\frac{-7}{40}}{3} = -\frac{7}{40} \div 3$

$= -\frac{7}{40} \times \frac{1}{3} = \boxed{\frac{-7}{120}}$

$D = \frac{30}{\frac{11}{24}} = 30 : \frac{11}{24} = 30 \times \frac{24}{11}$

$= \frac{30 \times 24}{11} = \boxed{\frac{720}{11}}$

Ex2

$E = (-2x+4)(-x-3)$

$= 2x^2 + 6x - 4x - 12 = \boxed{2x^2 + 2x - 12}$

$F = (4x+1)^2 - (-2+6x)$

$= 16x^2 + 8x + 1 + 2 - 6x = \boxed{16x^2 + 2x + 3}$

$G = \left(3x - \frac{5}{4}\right)^2 = 9x^2 - 2 \times 3x \times \frac{5}{4} + \left(\frac{5}{4}\right)^2$

$= \boxed{9x^2 - \frac{15x}{2} + \frac{25}{16}}$

$H = 2 - (x-4)(x-3)$

$H = 2 - (x^2 - 3x - 4x + 12)$

$H = 2 - x^2 + 3x + 4x - 12$

$\boxed{H = -x^2 + 7x - 10}$

Ex3

1) $dist\left(-\frac{2}{5}; \frac{4}{7}\right) = \left|-\frac{2}{5} - \frac{4}{7}\right| = \left|\frac{-14}{35} - \frac{20}{35}\right|$

$= \left|\frac{-34}{35}\right| = \boxed{\frac{34}{35}}$

Rmq : $dist\left(-\frac{2}{3}; \frac{4}{7}\right) = \frac{4}{7} - \left(-\frac{2}{3}\right) = \frac{4}{7} + \frac{2}{3} = \ldots$

Rappel : $|x-a| = dist(x;a)$

2) $x \in [-6;5]$

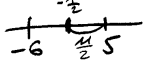
$\Leftrightarrow |x - c| \leq r$

$\Leftrightarrow \boxed{\left|x + \frac{1}{2}\right| \leq \frac{11}{2}}$

centre : $\frac{a+b}{2} = \frac{-6+5}{2} = -\frac{1}{2}$

rayon : $\frac{b-a}{2} = \frac{5+6}{2} = \frac{11}{2}$

donc $dist\left(x; -\frac{1}{2}\right) \leq \frac{11}{2}$



3) $2 < x < 12$

$\Leftrightarrow |x - c| < r$

$\Leftrightarrow \boxed{|x - 7| < 5}$

centre : $\frac{a+b}{2} = \frac{2+12}{2} = \frac{14}{2} = 7$

rayon : $\frac{b-a}{2} = \frac{12-2}{2} = 5$

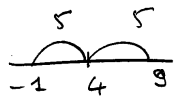
donc $dist(x;7) < 5$

4) $|x - 4| \leq 5$

$\Leftrightarrow dist(x;4) \leq 5$

$\Leftrightarrow 4 - 5 \leq x \leq 4 + 5$

$\Leftrightarrow \boxed{-1 \leq x \leq 9}$

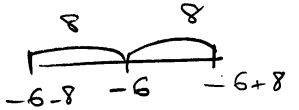


5) $|x + 6| < 8$

$\Leftrightarrow dist(x; -6) < 8$

$\Leftrightarrow -6 - 8 < x < -6 + 8$

$\Leftrightarrow \boxed{-14 < x < 2}$



6) $2{,}828 \leq \sqrt{8} \leq 2{,}829$

$\sqrt{8} \simeq 2{,}83$

Ex 4

1) $\sqrt{48} = \sqrt{4\times12} = \sqrt{4}\times\sqrt{4\times3} = 2\times\sqrt{4}\times\sqrt{3} = 2\times2\times\sqrt{3}$
$= \boxed{4\sqrt{3}}$

2) $5\sqrt{2} = \sqrt{25}\times\sqrt{2} = \boxed{\sqrt{50}}$

3) $I = 2\sqrt{3}(4\sqrt{3}-2)$
$= 2\sqrt{3}\times4\sqrt{3} - 4\sqrt{3} = 8\times3 - 4\sqrt{3} = \boxed{24-4\sqrt{3}}$

4) $J = (2\sqrt{3}+1)^2 = (2\sqrt{3})^2 + 2\times2\sqrt{3}\times1 + 1^2$
$= 4\times3 + 4\sqrt{3} + 1$
$= 12 + 4\sqrt{3} + 1 = \boxed{13+4\sqrt{3}}$

Ex 5

Algorithme 1 :

$S = 10$
$A = 1$
$S < 50$ donc $S = 20$ $A = 2$
$S < 50$ donc $S = 40$ $A = 3$
$S < 50$ donc $S = 80$ $A = 4$
$S \geqslant 50$ donc STOP.

Réponse $\boxed{A = 4}$

Algorithme 2

$A = 15$
$k = 1$ $A = 5$
$k = 2$ $A = 7$
$k = 3$ $A = 9$
$k = 4$ $A = 3$

Réponse $\boxed{A = 3}$