

وظيفة منزلية رقم [01]

التمرين الأول:

ضع علامة في الخانة المناسبة حسب أصغر مجموعة ينتمي لها العدد:

	$\mathbb{N}$	$\mathbb{Z}$	D	$\mathbb{Q}$	$\mathbb{R}$
-88.3					
$\sqrt{25}$					
$\sqrt{27}$					
$-\frac{7}{11}$					
-3π					
0					
$\frac{8}{10}$					
-201					
$\frac{20}{4}$					
$-\frac{88}{4}$					
$\frac{\sqrt{64}}{4\sqrt{25}}$					

التمرين الثاني:

بسط الأعداد التالية ، ثم اذكر أصغر مجموعة تنتمي إليها:

$$\frac{\sqrt{2}+1}{\sqrt{2}-1}-2\sqrt{2} \quad , \quad \frac{1001}{140} \quad , \quad \frac{2}{\sqrt{2}+1}-2\sqrt{2} \quad , \quad -(\sqrt{\sqrt{7}})^4 \quad , \quad \frac{2\pi+4}{5\pi+10}$$

$$\sqrt{6-\sqrt{\frac{7}{2}+\frac{\sqrt{12}+\sqrt{27}}{\sqrt{300}}}} \quad , \quad 5 \times \sqrt{1+\frac{3}{5}} \times \sqrt{1-\frac{3}{5}} \quad , \quad \frac{1+\frac{1}{2}}{1+\frac{1}{1+\frac{1}{3}}}$$

$$\sqrt{0.25} \quad , \quad \frac{(-12)^{16} \times (75)^{-4} \times (-4)^{-9}}{[(25)^{-2}]^4 \times (10)^4 \times (18)^6} \quad , \quad 9\left(\frac{1-\sqrt{7}}{3}\right)^2 + 2\sqrt{7}$$

التمرين الثالث:

أكتب على شكل كسر غير قابل للاختزال الأعداد الناطقة التالية:

$$d = 0.\underline{02}7027... \quad , \quad c = 8.4\underline{21}2212... \quad , \quad b = 5.\underline{24}5245... \quad , \quad a = 0.1\underline{4}...$$

التمرين الرابع:

بين أن الأعداد التالية طبيعية:

$$c = \frac{3^{10}}{243} \quad , \quad b = \frac{(a+b)^2 - (a-b)^2}{ab} \quad , \quad a = \frac{11}{30} - \frac{1}{5} - 2\left(\frac{1}{4} - \frac{1}{6}\right)$$

حل الوظيفة المنزلية رقم [01]

التمرين الأول:

	$\mathbb{N}$	$\mathbb{Z}$	D	$\mathbb{Q}$	$\mathbb{R}$
-88.3			✓		
$\sqrt{25}$	✓				
$\sqrt{27}$					✓
$-\frac{7}{11}$				✓	
-3π					✓
0	✓				
$\frac{8}{10}$			✓		
-201		✓			
$\frac{20}{4}$	✓				
$-\frac{88}{4}$		✓			
$\frac{\sqrt{64}}{4\sqrt{25}}$			✓		

$$\frac{2\pi+4}{5\pi+10} = \frac{2(\pi+2)}{5(\pi+2)} = \frac{2}{5} \in D$$

$$-(\sqrt{\sqrt{7}})^4 = -\left(\sqrt{7^{\frac{1}{2}}}\right)^4 = -\left(\left(7^{\frac{1}{2}}\right)^{\frac{1}{2}}\right)^4 = -\left(7^{\frac{1}{4}}\right)^4 = -7 \in \mathbb{Z}$$

$$\frac{2}{\sqrt{2}+1} - \frac{(2\sqrt{2})(\sqrt{2}+1)}{\sqrt{2}+1} = \frac{2-4-2\sqrt{2}}{\sqrt{2}+1} = \frac{-2\sqrt{2}-2}{\sqrt{2}+1} = \frac{-2(\sqrt{2}+1)}{\sqrt{2}+1} = -2 \in \mathbb{Z}$$

$$\frac{1001}{140} = \frac{1001 \div 7}{140 \div 7} = \frac{143}{20} \in D$$

$$\frac{\sqrt{2}+1}{\sqrt{2}-1} - 2\sqrt{2} = \frac{\sqrt{2}+1}{\sqrt{2}-1} - \frac{(2\sqrt{2})(\sqrt{2}-1)}{\sqrt{2}-1} = \frac{3\sqrt{2}-3}{\sqrt{2}-1} = \frac{3(\sqrt{2}-1)}{\sqrt{2}-1} = 3 \in \mathbb{N}$$

$$\frac{1+\frac{1}{2}}{1+\frac{1}{1+\frac{1}{3}}} = \frac{\frac{2}{2}+\frac{1}{2}}{1+\frac{1}{\frac{3}{3}+\frac{1}{3}}} = \frac{\frac{3}{2}}{1+\frac{1}{\frac{4}{3}}} = \frac{\frac{3}{2}}{1+\frac{3}{4}} = \frac{\frac{3}{2}}{\frac{7}{4}} = \frac{3}{2} \times \frac{4}{7} = \frac{12}{14} = \frac{6}{7} \in \mathbb{Q}$$

$$5 \times \sqrt{1 + \frac{3}{5}} \times \sqrt{1 - \frac{3}{5}} = 5 \times \sqrt{\left(1 + \frac{3}{5}\right)\left(1 - \frac{3}{5}\right)} = 5 \times \sqrt{1^2 - \left(\frac{3}{5}\right)^2} = 5 \times \sqrt{1 - \frac{9}{25}}$$

$$= 5 \times \sqrt{\left(\frac{25}{25} - \frac{9}{25}\right)} = 5 \times \sqrt{\left(\frac{16}{25}\right)} = 5 \times \frac{\sqrt{16}}{\sqrt{25}} = 5 \times \frac{4}{5} = 4 \in \mathbb{N}$$

$$\sqrt{6 - \sqrt{\frac{7}{2} + \frac{\sqrt{12} + \sqrt{27}}{\sqrt{300}}}} = \sqrt{6 - \sqrt{\frac{7}{2} + \frac{2\sqrt{3} + 3\sqrt{3}}{10\sqrt{3}}}} = \sqrt{6 - \sqrt{\frac{7}{2} + \frac{5\sqrt{3}}{10\sqrt{3}}}} = \sqrt{6 - \sqrt{\frac{7}{2} + \frac{1}{2}}}$$

$$= \sqrt{6 - \sqrt{4}} = \sqrt{6 - 2} = \sqrt{4} = 2 \in \mathbb{N}$$

$$9\left(\frac{1 - \sqrt{7}}{3}\right)^2 + 2\sqrt{7} = 9\frac{(1 - \sqrt{7})^2}{9} + 2\sqrt{7} = (1 - \sqrt{7})^2 + 2\sqrt{7} = 1 + 7 - 2\sqrt{7} + 2\sqrt{7} = 8 \in \mathbb{N}$$

$$\frac{(-12)^{16} \times (75)^{-4} \times (-4)^{-9}}{\left[(25)^{-2}\right]^4 \times (10)^4 \times (18)^6} = \frac{(12)^{16} \times (75)^{-4} \times (-4)^{-9}}{(25)^{-8} \times (10)^4 \times (18)^6} = \frac{(2^2 \times 3)^{16} \times (5^2 \times 3)^{-4} \times (-2 \times 2)^{-9}}{(5^2)^{-8} \times (5 \times 2)^4 \times (2 \times 3^2)^6}$$

$$= -\frac{2^{32} \times 3^{16} \times 3^{-4} \times 5^{-8} \times 2^{-9} \times 2^{-9}}{5^{-16} \times 5^4 \times 2^4 \times 2^6 \times 3^{12}} = -\frac{2^{14} \times 3^{12} \times 5^{-8}}{5^{-12} \times 2^{10} \times 3^{12}} = -2^4 \times 5^4 = -(2 \times 5)^4 = -10^4 \in \mathbb{Z}$$

$$\sqrt{0.25} = 0.5 \in D$$

انطلاقاً من $a = 0.\underline{14}14\dots$ ، نجد:

$$100a = 14.1414\dots$$

$$100a = 14 + 0.1414\dots$$

$$100a = 14 + a$$

$$99a = 14$$

$$a = \frac{14}{99}$$

لدينا: $b = 5.\underline{245}245\dots$

$$x = 0.\underline{245}245\dots \quad \text{نضع } b = 5 + x$$

انطلاقاً من $x = 0.\underline{245}245\dots$ ، نجد:

$$1000x = 245.\underline{245}245\dots$$

$$1000x = 245 + 0.\underline{245}245\dots$$

$$1000x = 245 + x$$

$$999x = 245$$

$$x = \frac{245}{999}$$

$$b = 5 + x = 5 + \frac{245}{999} = \frac{5 \times 999}{999} + \frac{245}{999} = \frac{5240}{999} \quad \text{ومنه:}$$

لدينا: $c = 8.\underline{421}2212\dots$

$$x = 0.\underline{212}2212\dots \quad \text{نضع } 10c = 84 + x \text{ و } 10c = 84.\underline{212}2212\dots$$

انطلاقاً من $x = 0.\underline{212}212\dots$ ، نجد:

$$1000x = 212.\underline{212}212\dots$$

$$1000x = 212 + 0.\underline{212}212\dots$$

$$1000x = 212 + x$$

$$999x = 212$$

$$x = \frac{212}{999}$$

$$10c = 84 + x = 84 + \frac{212}{999} = \frac{84 \times 999}{999} + \frac{212}{999} = \frac{84128}{999}$$

ومنه:

$$c = \frac{84128}{9990}$$

انطلاقاً من $d = 0.\underline{027}027\dots$ ، نجد:

$$1000d = 27.\underline{027}027\dots$$

$$1000d = 27 + 0.\underline{027}027\dots$$

$$1000d = 27 + d$$

$$999d = 27$$

$$d = \frac{27}{999}$$

$$a = \frac{11}{30} - \frac{1}{5} - 2\left(\frac{1}{4} - \frac{1}{6}\right) = \frac{11}{30} - \frac{1}{5} - \frac{2}{4} + \frac{2}{6} = \frac{11 \times 2}{30 \times 2} - \frac{1 \times 12}{5 \times 12} - \frac{2 \times 15}{4 \times 15} + \frac{2 \times 10}{6 \times 10}$$

$$a = \frac{22}{60} - \frac{12}{60} - \frac{30}{60} + \frac{20}{60} = 0 \in \mathbb{N}$$

$$b = \frac{(a+b)^2 - (a-b)^2}{ab} = \frac{(a^2 + b^2 + 2ab) - (a^2 + b^2 - 2ab)}{ab}$$

$$b = \frac{a^2 + b^2 + 2ab - a^2 - b^2 + 2ab}{ab} = \frac{4ab}{ab} = 4 \in \mathbb{N}$$

$$c = \frac{3^{10}}{243} = \frac{3^{10}}{3^5} = 3^{10-5} = 3^5 \in \mathbb{N}$$