حل تمارين الأعـــداد و الحساب

تمارين (الكتاب المدرسي) الجزء الأول

أصحيح أم خاطئ؟

1) $\frac{1}{7}$ ينتمي إلى: ℚ و ℝ.

2) العدد الطبيعي هو: $\frac{\sqrt{52}}{\sqrt{13}}$ لأن $\boxed{\frac{\sqrt{52}}{\sqrt{13}}=\sqrt{\frac{52}{13}}=\sqrt{4}=2}$.

3) العدد غير العشري هو: $\frac{1}{3\times10^2}$ لأنه لا يمكننا كتابة مقامه بالشكل: 10^n.

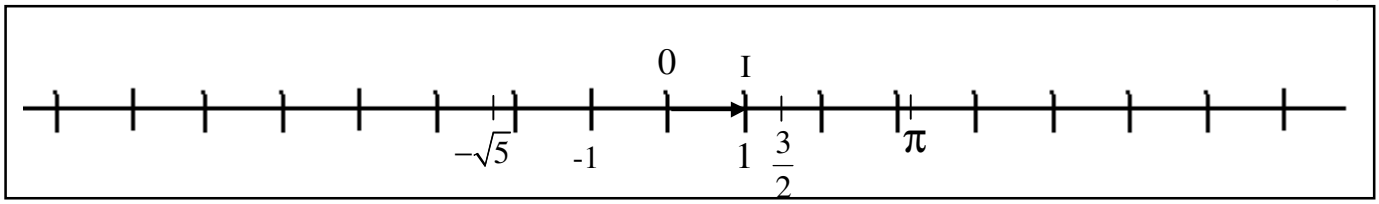
4) العدد الأولي هو: 121 لأنه يقبل القسمة على 1 وعلى نفسه فقط، $259=7\times37$ و $183=3\times61$.

5) التحليل المناسب للعدد 6270 هو: $2\times3\times5\times209$.

6) العدد $225=1^3+2^3+3^3+4^3+5^3$.

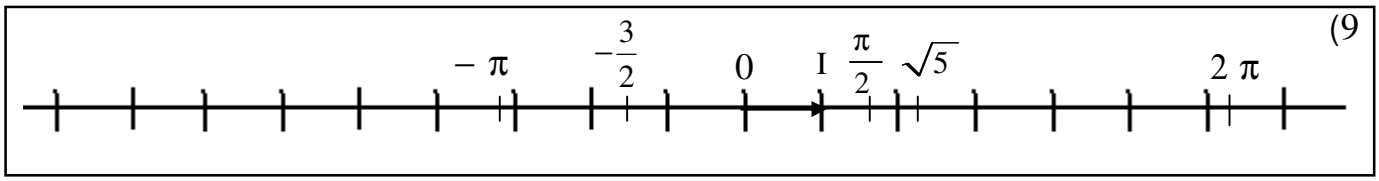
تمثيل أعداد على المستقيم العددي:

7)

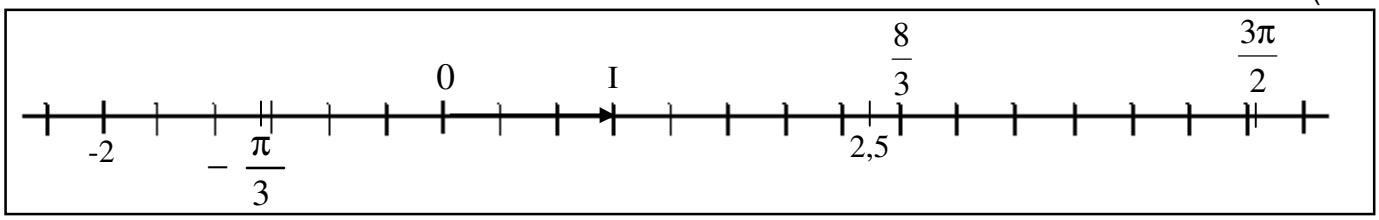


8) $x=5,17\ ;\ y=5,25\ ;\ z=5,36$.

9)



10)



مجموعات الأعداد:

11) $10\in\mathbb{N}$; $3,5\notin\mathbb{Z}$; $\frac{1}{3}\notin\mathbb{D}$; $\frac{\sqrt{2}}{3}\notin\mathbb{Q}$; $\frac{2\pi}{3}\in\mathbb{R}$.

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الأعداد	¥	Z	D	/	¡
-3		×	×	×	×
125	×	×	×	×	×
$2\sqrt{3}$					×
$\frac{1}{\sqrt{2}}$					×
$-\frac{7}{3}$				×	×
π					×
0	×	×	×	×	×
2,75			×	×	×



(13

- $A=\frac{-\sqrt{144}}{3}=\frac{-12}{3}=-4\Leftrightarrow A\in Z$.
- $B=\frac{\pi}{3,14}=\frac{3,14}{3,14}=1\Leftrightarrow B\in ¥$.
- $C=\sqrt{2}-\frac{1}{\sqrt{2}-1}=\frac{\sqrt{2}\left(\sqrt{2}-1\right)-1}{\sqrt{2}-1}=\frac{2-\sqrt{2}-1}{\sqrt{2}-1}=\frac{1-\sqrt{2}}{\sqrt{2}-1}=\frac{-(\sqrt{2}-1)}{\sqrt{2}-1}=-1\Leftrightarrow C\in Z$.

(14 $I=[-4;3]$

- عدد العناصر هو 4. $\Leftrightarrow I_{¥}=\{0;1;2;3\}$
- عدد العناصر هو 8. $\Leftrightarrow I_{Z}=\{-4;-3;-2;-1;0;1;2;3\}$
- عدد عناصر / التي تشملها I هو عدد غير محدود.

(15

الأعداد	¥	Z	D	/	¡
58	×	×	×	×	×
$\frac{3}{2}$			×	×	×
$-\frac{15}{3}$		×	×	×	×
$1,5\times10^{3}$	×	×	×	×	×
2π					×
$\frac{1}{100}$			×	×	×
$\sqrt{64}$	×	×	×	×	×
$(0,5)^2$			×	×	×

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الأعداد	3,503	10^{-3}	-10^{3}	3587	4×10^{-2}	π	$-\frac{3}{100}$	$-\frac{22}{7}$	3,14
الأعداد العشرية	×	×	×	×	×		×		×
الأعداد الناطقة غير العشرية								×	
الأعداد غير الناطقة						×			
الأعداد	$\sqrt{2}$	$\sqrt{0,25}$	$\frac{1}{3}$	$-\frac{21}{6}$	$\frac{2}{\pi}$	$\sqrt{\pi}$	$\sqrt{\sqrt{16}}$	0	
الأعداد العشرية		×		×			×	×	
الأعداد الناطقة غير العشرية			×						
الأعداد غير الناطقة	×				×	×			

17) **تذكير**: العدد الناطق هو الذي يكتب على شكل كسر $\frac{p}{q}$ غير قابل للاختزال، أي أن p و q أوليان فيما بينهما، والعدد العشري هو الذي يكتب على الشكل $\frac{a}{10^n}$ أو $\frac{a}{2^m\times5^n}$، ولدينا أيضا $\mathbb{D}\subset\mathbb{Z}\subset\mathbb{D}\subset\mathbb{Q}$:

- $2,5=\frac{25}{10}=\frac{5}{2}$ إذن 2,5 هو عدد ناطق.
- $-0,47=-\frac{47}{10^2}$ -0,47 هو عدد عشري إذن فهو عدد ناطق.
- 120 عدد طبيعي إذن فهو عدد ناطق.
- $\frac{0,125}{62,5}=\frac{125}{62500}=\frac{125}{625\times10^2}=\frac{1}{5\times10^2}=\frac{1}{2^2\times5^3}$ $\frac{0,125}{62,5}$ عدد عشري إذن فهو عدد ناطق.
- $\frac{5}{40\times10^{-2}}=\frac{5}{0,4}=12,5$ $\frac{5}{40\times10^{-2}}$ عدد عشري إذن فهو عدد ناطق.

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$25000\times10^{-4}=2,5$
$52\times10^{-3}=0,052$
$3\times10^{-2}=0,03$
$12\times10^{6}=12000000$
$6,125\times10^{-3}=0,006125$
$62,39\times10^{4}=623900$

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- $A=0,027027.....$

لنفرض $x=0,027027$ لدينا إذن: $1000x=27,027.....$

$1000x=27+0,027.....$

$1000x=27+x$

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$$999x = 27$$

$$x = \frac{27}{999} = \frac{1}{37}$$

ومنه فإن $\boxed{A = \frac{1}{37}}$.

• $B = 34,1456\,456.....$

$$10B = 341,456\,456 = 341 + 0,456\,456..... \quad (1)$$

لنفرض $x = 0,456\,456...$ لدينا إذن: $1000x = 456,456...$

$$1000x = 456 + 0,456...$$

$$1000x = 456 + x$$

$$999x = 456$$

$$x = \frac{456}{999} = \frac{152}{333} \quad (2)$$

من (1) و(2) لدينا: $10B = 341 + x = 341 + \frac{152}{333}$

$$10B = \frac{341\times 333 + 152}{333} = \frac{113705}{333}$$

$$B = \frac{113705}{333\times 10} = \frac{113705}{3330}$$

إذن $\boxed{B = \frac{113705}{3330}}$.

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20) **تذكير**: العدد العشري هو الذي يكتب على الشكل $\frac{a}{10^n}$ أو $\frac{a}{2^m\times 5^n}$، ولدينا أيضا $\mathbb{D} \subset \mathbb{Z} \subset ¥$:

الأعداد	$\frac{3}{2}$	$-\frac{13}{12}$	$\frac{15}{4}$	$\frac{71}{25}$	$-\frac{32}{105}$	$\frac{33}{375}$	$\frac{1}{2000}$
كتابة العدد بطريقة أخرى		$-\frac{13}{2^2\times 3}$	$\frac{15}{2^2}$	$\frac{71}{5^2}$	$-\frac{2^5}{3\times 5\times 7}$	$\frac{11}{5^3}$	$\frac{1}{2^4\times 5^3}$
الأعداد العشرية	×		×	×		×	×
الأعداد الناطقة		×			×		

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21) $0,00038\times 32,9562$ باستعمال الحاسبة ودون لمسة الفاصلة نكتب كما يلي:

$$38\times 10^{-5}\times 329562\times 10^{-4} = 12523356\times 10^{-9} = 0,012523356$$

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$\frac{1}{100}=10^{-2}$
$\left(\frac{1}{10}\right)^{2}=\frac{1^{2}}{10^{2}}=10^{-2}$
$(2\times 50)^{-2}=(10^{2})^{-2}=10^{-4}$

ومنه فإن: $\frac{1}{100}=\left(\frac{1}{10}\right)^{2}=10^{-2}$.

(23

$\frac{0,21}{1,05}=\frac{21}{105}=\frac{3\times 7}{3\times 5\times 7}=\frac{1}{5}\Leftrightarrow \frac{0,21}{1,05}\in D$
$\frac{7\pi+14}{3\pi+6}=\frac{7(\pi+2)}{3(\pi+2)}=\frac{7}{3}\Leftrightarrow \frac{7\pi+14}{3\pi+6}\in /$
$\frac{16}{6}-\frac{11}{3}=\frac{8}{3}-\frac{11}{3}=-\frac{3}{3}=-1\Leftrightarrow \frac{16}{6}-\frac{11}{3}\in Z$
$-\frac{6\pi}{3}=-2\pi\Leftrightarrow -\frac{6\pi}{3}\in ¡$
$\frac{2}{\sqrt{2}+1}-2\sqrt{2}=\frac{2-2\sqrt{2}\left(\sqrt{2}+1\right)}{\sqrt{2}+1}$ $=\frac{2-2\times 2-2\sqrt{2}}{\sqrt{2}+1}=\frac{-2(\sqrt{2}+1)}{\sqrt{2}+1}=-2$ $\Leftrightarrow \frac{2}{\sqrt{2}+1}-2\sqrt{2}\in Z$



(24

- $A=(589-32)\div(633+917)=0,359.....\Leftrightarrow A=\frac{589-32}{633+917}$
- $B=7\div(2\times 3\times 4)=0,2916666....\Leftrightarrow B=\frac{7}{2\times 3\times 4}$
- $C=\sqrt{(56,25+7,75)}-8=0\Leftrightarrow C=\sqrt{56,25+7,75}-8$

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(25

- $3a+\frac{1}{a}+2 \Leftrightarrow 3\times a+(1\div a)+2$
- $\frac{3a+1}{a+2} \Leftrightarrow (3\times a+1)\div(a+2)$
- $\frac{3(a+1)}{a}+2 \Leftrightarrow \left(3\times(a+1)\div a\right)+2$
- $3a+\frac{1}{a+2} \Leftrightarrow 3\times a+1\div(a+2)$
- $\frac{3(a+1)}{a+2} \Leftrightarrow [3\times(a+1)]\div(a+2)$

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- $(-3)^5 < 0$ لأن العدد 5 فردي.
- $(-5)^8 > 0$ لأن العدد 8 زوجي.
- $-3^5 < 0$ لأن $-243 = -3^5$.
- $10^{-3} > 0$ لأن $0,001 = 10^{-3}$.
- $(-3^3)^2 > 0$ لأن العدد 2 زوجي.

(27

- $2^2 \times 3^3 = 4 \times 27 = 108$.
- $2^2 \times 3^3 \times 5 = 4 \times 27 \times 5 = 108 \times 5 = 540$.
- $2^3 \times 3^3 = 8 \times 27 = 216$.
- $2^3 \times 3^2 = 8 \times 9 = 72$.
- $\left(\frac{1}{2}\right)^2 \times 3^3 = \frac{1}{4} \times 27 = \frac{27}{4}$.
- $\left(\frac{1}{3}\right)^2 \times \left(\frac{3}{2}\right)^3 = \frac{1}{3^2} \times \frac{3^3}{2^3} = \frac{3}{8}$.
- $2 \times \left(\frac{1}{2}\right) \times \left(\frac{4}{5}\right)^2 = \frac{4^2}{5^2} = \frac{16}{25}$.
- $\left(-\frac{1}{2}\right)^2 \times \left(-\frac{1}{3}\right)^3 = \frac{1}{2^2} \times \left(-\frac{3^3}{2^3}\right) = -\frac{27}{32}$.
- $\left(-\frac{5}{4}\right) \times \left(\frac{4}{5}\right)^2 \times \left(-\frac{2}{5}\right) = \frac{(-5) \times 4^2 \times (-2)}{4 \times 5^2 \times 5} = \frac{8}{25}$.



(28

$$A = \frac{(-2)^5 \times (-6)^3 \times (-3)^8}{(15)^2 \times (-12)^3}$$

$$A = \frac{(-2)^5 \times (-2)^3 \times 3^3 \times (-3)^8}{3^2 \times 5^2 \times (-4)^3 \times 3^3} = \frac{2^8 \times 3^8}{3^2 \times 5^2 \times (-1)^3 \times 2^6}$$

$$A = \frac{2^2 \times 3^6}{-25} = -\frac{4 \times 729}{25} = -\frac{2916}{25}$$

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(29

- $A=(2^3\times 2^{-4})^2\times(3^3)^2\times 3^{-5}$

  $A=(2^3\times 2^{-4})^2\times(3^3)^2\times 3^{-5}$

  $A=(2^{-1})^2\times 3^6\times 3^{-5}=2^{-2}\times 3=\frac{3}{4}$

- $B=2^3\times 2^4\times 2^{-5}=2^{3+4-5}=2^2=4$.
- $C=\left(\frac{2}{3}\right)^2\times 3^3=\frac{2^2\times 3^3}{3^2}=4\times 3=12$.
- $D=(2^3\times 3^2)^2=2^6\times 3^4=64\times 81=5184$.
- $E=\left(-\frac{1}{3}\right)^2\times 5^{-2}\times\left(\frac{3}{5}\right)^3=\frac{1}{3^2}\times\frac{1}{5^2}\times\frac{3^3}{5^3}=\frac{3}{5^5}=\frac{3}{3125}$.
- $F=\left(\frac{2}{7}\right)^4\times\left(\frac{7}{4}\right)^2\times\left(\frac{-49}{2}\right)^3=\frac{2^4}{7^4}\times\frac{7^2}{2^4}\times\left(-\frac{7^2}{2}\right)^3=\frac{1}{7^2}\times(-1)\times\frac{7^6}{2^3}=-\frac{7^4}{8}=-\frac{2401}{8}$
- $G=\left(\frac{2}{3}\right)^{-2}\times\left(\frac{3}{4}\right)^4\times\left(\frac{27}{4}\right)^{-1}=\frac{3^2}{2^2}\times\frac{3^4}{4^4}\times\frac{4}{27}=\frac{3^6}{4^4\times 3^3}=\frac{3^3}{4^4}=\frac{27}{256}$.

(30

- $a=\frac{2^4}{10^5}=\frac{2^4}{2^5\times 5^5}=2^{-1}\times 5^{-5}$.
- $b=\frac{25^3}{5^{-5}}=\frac{5^6}{5^{-5}}=5=2^0\times 5^1$.
- $c=\frac{(10^2)^3}{2^6\times 5^6}=\frac{10^6}{2^6\times 5^6}=\frac{2^6\times 5^6}{2^6\times 5^6}=1=2^0\times 5^0$.

(31

- $A=\frac{12^5\times 35^{-2}}{49^{-3}\times 21^4}=\frac{3^5\times 4^5\times 5^{-2}\times 7^{-2}}{(7^2)^{-3}\times 3^4\times 7^4}$

  $A=\frac{3\times 4^5\times 5^{-2}\times 7^{-2}}{7^{-6}\times 7^4}=\frac{3\times 4^5}{5^2}=\frac{3072}{25}$

- $B=\frac{(-5)^3\times(-8)^3\times(-9)^2}{15^2\times 12^2}=\frac{(2^3)^3\times 5^3\times(3^2)^2}{3^4\times 5^2\times 4^2}$

  $B=\frac{2^9\times 5\times 3^4}{3^4\times 2^4}=2^5\times 5=160$

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(32

$A = 987891236^2 - 987891235^2$

•

$A = 987891236^2 - 987891235^2 = 1976000000$

•

•

$a = 987891236$

$A = a^2 - (a-1)^2 = a^2 - (a^2 + 1 - 2a) = 2a - 1$

:A

$A = 2 \times 987891236 - 1 = 1975782471$

•

.1976000000



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$\sqrt{\pi}=1,772453..... \Leftrightarrow \sqrt{\pi}\in\mathbb{R}$
$\sqrt{(-3)^2}=\sqrt{3^2}=3 \Leftrightarrow \sqrt{(-3)^2}\in\mathbb{R}$
$\sqrt{-25}\notin\mathbb{R}$
$\sqrt{13-\sqrt{136}}=\sqrt{13-11,66...}=1,3380.... \Leftrightarrow \sqrt{13-\sqrt{136}}\in\mathbb{R}$
$\sqrt{\frac{5}{9}}=\frac{\sqrt{5}}{3} \Leftrightarrow \sqrt{\frac{5}{9}}\in\mathbb{R}$

(34

$\sqrt{200}=\sqrt{100\times 2}=10\sqrt{2}$
$\sqrt{6}\times\sqrt{48}=\sqrt{6\times 48}=\sqrt{6\times 6\times 2^2\times 2}=12\sqrt{2}$
$\sqrt{\frac{75}{27}}=\sqrt{\frac{25\times 3}{9\times 3}}=\sqrt{\frac{25}{9}}=\frac{5}{3}$
$\sqrt{3^2+4^2}=\sqrt{9+16}=\sqrt{25}=5$

(35

$A=2\sqrt{3}+5\sqrt{12}-\sqrt{75}=2\sqrt{3}+10\sqrt{3}-5\sqrt{3}=7\sqrt{3}$
$B=3\sqrt{80}-\sqrt{180}-\sqrt{45}=12\sqrt{5}-6\sqrt{5}-3\sqrt{5}=3\sqrt{5}$

(36

$\frac{1}{\sqrt{2}}=\frac{\sqrt{2}}{\sqrt{2}\times\sqrt{2}}=\frac{\sqrt{2}}{2}$
$\frac{2}{\sqrt{2}}=\frac{\sqrt{2}\times\sqrt{2}}{\sqrt{2}}=\sqrt{2}$
$\sqrt{8}-\sqrt{2}=2\sqrt{2}-\sqrt{2}=\sqrt{2}$

$\frac{1}{\sqrt{2}}=\frac{\sqrt{2}}{2}$ $\sqrt{8}-\sqrt{2}=\frac{2}{\sqrt{2}}=\sqrt{2}$:

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$$E=\left(\frac{12+25\sqrt{6}}{6}\right)\div\left(1+\frac{\sqrt{6}}{4}-\frac{1}{\sqrt{6}}+\sqrt{24}\right)$$

$$E=\left(\frac{12+25\sqrt{6}}{6}\right)\div\left(1+\frac{\sqrt{6}}{4}-\frac{\sqrt{6}}{6}+2\sqrt{6}\right)=\left(\frac{12+25\sqrt{6}}{6}\right)\div\left(\frac{12+3\sqrt{6}-2\sqrt{6}+24\sqrt{6}}{12}\right)$$

$$E=\left(\frac{12+25\sqrt{6}}{6}\right)\div\left(\frac{12+25\sqrt{6}}{12}\right)=\left(\frac{12+25\sqrt{6}}{6}\right)\times\left(\frac{12}{12+25\sqrt{6}}\right)\Leftrightarrow E=2$$

(38 $\frac{1+\sqrt{5}}{2}$:

$$\frac{1}{\frac{1+\sqrt{5}}{2}}=\frac{2}{1+\sqrt{5}}=\frac{2(1-\sqrt{5})}{(1+\sqrt{5})(1-\sqrt{5})}=\frac{2(1-\sqrt{5})}{1-5}=\frac{2(1-\sqrt{5})}{-4}=-\frac{1-\sqrt{5}}{2}=\frac{\sqrt{5}-1}{2}.$$

(39

$\sqrt{81}=9$
$\sqrt{175}=\sqrt{25\times7}=5\sqrt{7}$
$\sqrt{1080}=\sqrt{36\times30}=6\sqrt{30}$
$\sqrt{27}+\sqrt{48}=3\sqrt{3}+4\sqrt{3}=7\sqrt{3}$
$\sqrt{0,45}=\sqrt{\frac{45}{100}}=\frac{3\sqrt{5}}{10}$
$\sqrt{27}+2\sqrt{75}-\sqrt{108}=3\sqrt{3}+10\sqrt{3}-6\sqrt{3}=7\sqrt{3}$
$\sqrt{36}-3\sqrt{6}+5\sqrt{144}=6-3\sqrt{6}+5\times12=6+60-3\sqrt{6}=66-3\sqrt{6}$
$\sqrt{\frac{8}{9}}\times\sqrt{\frac{12}{25}}\times\sqrt{\frac{225}{24}}=\frac{2\sqrt{2}}{3}\times\frac{2\sqrt{3}}{5}\times\frac{15}{2\sqrt{6}}=\frac{2\times2\times15\sqrt{6}}{2\times15\sqrt{6}}=2$

(40

$\left(1+\sqrt{2}\right)^2=1+2+2\sqrt{2}=3+2\sqrt{2}$
$\left(2\sqrt{5}+3\right)^2=4\times5+9+12\sqrt{5}=29+12\sqrt{5}$
$\left(1-5\sqrt{2}\right)^2=1+25\times2-10\sqrt{2}=51-10\sqrt{2}$
$\left(7-\sqrt{3}\right)\left(7+\sqrt{3}\right)=7^2-(\sqrt{3})^2=49-3=46$
$\left(1-\sqrt{2}\right)\left(1+\sqrt{3}\right)\times2\sqrt{2}=\left(1+\sqrt{3}-\sqrt{2}-\sqrt{6}\right)\times2\sqrt{2}$ $=2\sqrt{2}+2\sqrt{6}-2\times2-2\sqrt{12}$ $=2\sqrt{2}-4\sqrt{3}+2\sqrt{6}-4$

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$$\frac{5}{2\sqrt{10}}=\frac{5\sqrt{10}}{20}=\frac{\sqrt{10}}{4}$$

$$\frac{\sqrt{7}}{3\sqrt{5}}=\frac{\sqrt{35}}{3\times 5}=\frac{\sqrt{35}}{15}$$

$$\frac{\sqrt{2}+1}{\sqrt{2}+2}=\frac{(\sqrt{2}+1)(\sqrt{2}-2)}{\left(\sqrt{2}+2\right)\left(\sqrt{2}-2\right)}=\frac{2-2\sqrt{2}+\sqrt{2}-2}{2-4}=\frac{-\sqrt{2}}{-2}=\frac{\sqrt{2}}{2}$$

$$\frac{2-\sqrt{3}}{2+\sqrt{3}}=\frac{(2-\sqrt{3})^2}{\left(2+\sqrt{3}\right)\left(2-\sqrt{3}\right)}=\frac{4+3-4\sqrt{3}}{4-3}=\frac{7-4\sqrt{3}}{1}=7-4\sqrt{3}$$

(42

$$A=\frac{2}{\sqrt{33}}\left(\frac{\sqrt{363}}{\sqrt{2}-1}\right)=\frac{2}{\sqrt{33}}\left(\frac{11\sqrt{3}(\sqrt{2}+1)}{(\sqrt{2}-1)(\sqrt{2}+1)}\right)$$

$$A=\frac{2}{\sqrt{33}}\left(\frac{11\sqrt{6}+11\sqrt{3}}{2-1}\right)=\frac{22\sqrt{6}+22\sqrt{3}}{\sqrt{33}}$$

$$A=\frac{\left(22\sqrt{6}+22\sqrt{3}\right)\times\sqrt{33}}{33}=\frac{22\sqrt{198}+22\sqrt{99}}{33}$$

$$A=\frac{2\times 11\times 3\sqrt{22}+2\times 11\times 3\sqrt{11}}{33}$$

$$A=2\sqrt{22}+2\sqrt{11}$$

$$B=\frac{3\sqrt{360}-2\sqrt{180}}{\sqrt{10}-\sqrt{2}}=\frac{3\times 6\sqrt{10}-2\times 6\sqrt{5}}{\sqrt{10}-\sqrt{2}}$$

$$B=\frac{(18\sqrt{10}-12\sqrt{5})(\sqrt{10}+\sqrt{2})}{(\sqrt{10}-\sqrt{2})(\sqrt{10}+\sqrt{2})}$$

$$B=\frac{18\times 10+18\times 2\sqrt{5}-12\times 5\sqrt{2}-12\sqrt{10}}{10-2}$$

$$B=\frac{180+36\sqrt{5}-60\sqrt{2}-12\sqrt{10}}{8}$$

$$B=\frac{45+9\sqrt{5}-15\sqrt{2}-3\sqrt{10}}{2}$$

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(43 $a+b=1$ و $a^2+b^2=2$ (1).

- $(a+b)^2=a^2+b^2+2ab$

$\Leftrightarrow 2ab=(a+b)^2-(a^2+b^2)=1-2=-1 \Leftrightarrow ab=-\frac{1}{2}=-0,5$.

- $a^4+b^4=(a^2+b^2)^2-2a^2b^2=(a^2+b^2)^2-2(ab)^2$

$=2^2-2\left(-\frac{1}{2}\right)^2=4-2\times\frac{1}{4}=4-\frac{1}{2}=\frac{8-1}{2}=\frac{7}{2}=3,5$.

.calculer a^4+b^4 بدون حساب a و b

- $a=\frac{1-\sqrt{3}}{2}$ و $b=\frac{1+\sqrt{3}}{2}$

- $a+b=\frac{1-\sqrt{3}}{2}+\frac{1+\sqrt{3}}{2}=\frac{1-\sqrt{3}+1+\sqrt{3}}{2}=\frac{2}{2}=1$.

- $a^2+b^2=\left(\frac{1-\sqrt{3}}{2}\right)^2+\left(\frac{1+\sqrt{3}}{2}\right)^2$

$=\frac{1+3-2\sqrt{3}}{4}+\frac{1+3+2\sqrt{3}}{4}$

$=\frac{4-2\sqrt{3}+4+2\sqrt{3}}{4}=\frac{8}{4}=2$



.استنتج (1) دون حساب a و b

(44

- $\sqrt{2}\times\sqrt{2+\sqrt{3}}=\sqrt{2\times(2+\sqrt{3})}=\sqrt{4+2\sqrt{3}}$ (1)

- $(1+\sqrt{3})^2=1+3+2\sqrt{3}=4+2\sqrt{3} \Leftrightarrow 1+\sqrt{3}=\sqrt{4+2\sqrt{3}}$ (2)

.$1+\sqrt{3}=\sqrt{4+2\sqrt{3}}=\sqrt{2}\times\sqrt{2+\sqrt{3}}$ استنتج (2) و(1)

- $\frac{1}{\sqrt{2}+1}+\frac{1}{\sqrt{3}+\sqrt{2}}+\frac{1}{\sqrt{4}+\sqrt{3}}$

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

$=\frac{\sqrt{2}-1}{2-1}+\frac{\sqrt{3}-\sqrt{2}}{3-2}+\frac{2-\sqrt{3}}{4-3}=\sqrt{2}-1+\sqrt{3}-\sqrt{2}+2-\sqrt{3}$

$=\sqrt{2}-\sqrt{2}+\sqrt{3}-\sqrt{3}-1+2=1$

(45 $E=x^2-3x+4$

: $x=1+\sqrt{3}$ عندما

$E=(1+\sqrt{3})^2-3(1+\sqrt{3})+4$

$=1+3+2\sqrt{3}-3-3\sqrt{3}+4$

$=5-\sqrt{3}$

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(46

$\frac{2000}{7} = 285,714$
$\frac{\pi}{60} = 0,052$
$\cos 80° = 0,174$
$\frac{3\sqrt{7}-9}{2} = -0,531$

(47

$1205\sqrt{3} \times 4.10^{-4}$	$\frac{3\pi}{2}$	
$0,835$	$4,712$	10^{-3}

(48

$-34,56 \times 10^{-2}$	$5,03 \times 10^{-4}$	$6,5 \times 10^{5}$	12×10^{-3}	
$-3,456 \times 10^{-1}$	/	/	$1,2 \times 10^{-2}$	

(49

150×10^{-3}	$27,31 \times 10^{3}$	$0,095$	$251,3$	
$1,50 \times 10^{-1}$	$2,731 \times 10^{4}$	$9,5 \times 10^{-2}$	$2,513 \times 10^{2}$	
2×10^{-1}	3×10^{4}	1×10^{-1}	3×10^{2}	

(50

$$A = 9 \times 10^{-3} + 0,4 \times 10^{-2} - 9 \times 10^{-4}$$
$$A = 9 \times 10^{-3} + 4 \times 10^{-3} - 0,9 \times 10^{-3}$$
$$A = (9 + 4 - 0,9) \times 10^{-3}$$
$$A = 12,1 \times 10^{-3}$$
$$A = 1,21 \times 10^{-2}$$

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(51 ...$149\times10^{6}\,km$ ...

$149\times10^{6}\,km=149\times10^{6}\times10^{3}\,m=149\times10^{9}\,m.$

$v=\frac{d}{t}\Leftrightarrow t=\frac{d}{v}=\frac{149\times10^{9}}{3\times10^{8}}=49,66\times10=496,6s.$

(52

$\frac{181,47}{78,956}$	$0,05\times1200\times10^{-3}$	$851,7\times0,0018\times0,073$	...
$2,298$	$0,06$	$0,1119$	...
3×10^{0}	6×10^{-2}	1×10^{-1}	...

(53

... $1mm^{3}$ ... $.8,5\times10^{19}=\frac{8,96\times10^{-6}}{1,05\times10^{-25}}$ ...

... kg ... .

(54

$(ab)^2$	ab	a^2b^2	b^2	a^2	b	a
2×10^{-11}	4×10^{-6}	2×10^{-11}	4×10^{-29}	5×10^{17}	6×10^{-15}	7×10^{8}

... a^2b^2 ... $(ab)^2$.

(55

$R=6371km=6,371\times10^{7}\,cm.$

$v=\frac{4\pi\times R^{3}}{3}=\frac{4\times\pi\times(6,371\times10^{7})^{3}}{3}=1,08\times10^{24}\,cm^{3}.$

$\mu=\frac{m}{v}\Leftrightarrow m=\mu\times v=5,5\times1,08\times10^{24}=5,94\times10^{24}\,g=5,94\times10^{18}\,T.$

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[illegible]

[illegible]

[illegible]:

(56

- [illegible]
- [illegible]
- [illegible]

(57

[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]

(58 [illegible]

(59

- $2^3 \times 3^2 \times 5 \times 7 = 2520$.
- $7951 \times 1 = 7951$.

(60

- [illegible]
- [illegible]
- [illegible]

(61 $P(n) = n^2 + n - 41$ $n \in \mathbb{N}$.

- [illegible]
- [illegible]

n	0	1	2	3	4
P(n)	-41	-39	-35	-29	-21

[illegible] $P(n) = 15$ [illegible] $n = 7$ [illegible].

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.1+2+4+7+14=28 ﻭﻣﺠﻤﻮﻋﻬﺎ 28 :ﻫﻲ 30 ﻭ 25 ﺑﻴﻦ ﺍﻟﻌﺪﺩﻳﻦ ﺍﻟﻜﺎﻣﻠﻴﻦ ﺍﻟﻤﺤﺼﻮﺭﻳﻦ

(63

- $(n+1)^2-n^2=n^2+2n+1-n^2=2n+1$

.ﻫﻮ ﻓﺮﻕ ﻣﺮﺑﻌﻲ ﻋﺪﺩﻳﻦ ﻃﺒﻴﻌﻴﻴﻦ ﻣﺘﺘﺎﻟﻴﻴﻦ ﻳﺴﺎﻭﻱ ﺩﺍﺋﻤﺎ 2n+1 ﺍﻟﻌﺪﺩ ﺍﻟﻔﺮﺩﻱ

- $13=12+1=2\times6+1\Leftrightarrow13=(6+1)^2-6^2=7^2-6^2=49-36=13$.
- $45=44+1=2\times22+1\Leftrightarrow45=(22+1)^2-22^2=23^2-22^2=529-484=45$.

(64

- $S=\frac{1}{2}+\frac{1}{6}+\frac{1}{12}+\frac{1}{20}+\frac{1}{30}$

$S=\frac{30}{2\times30}+\frac{10}{6\times10}+\frac{5}{12\times5}+\frac{3}{20\times3}+\frac{2}{30\times2}$

$S=\frac{30+10+5+3+2}{60}=\frac{50}{60}=\frac{5}{6}$

- $A=\frac{1}{n}-\frac{1}{n+1}$

$A=\frac{1}{n}-\frac{1}{n+1}=\frac{n+1-n}{n(n+1)}=\frac{1}{n^2+n}$.

$\frac{1}{n}-\frac{1}{n+1}=\frac{1}{n^2+n}$



5	4	3	2	1	n
$\frac{1}{30}$	$\frac{1}{20}$	$\frac{1}{12}$	$\frac{1}{6}$	$\frac{1}{2}$	A

- $S=\frac{1}{2}+\frac{1}{6}+\frac{1}{12}+\frac{1}{20}+\frac{1}{30}$

$S=\frac{1}{1}-\frac{1}{2}+\frac{1}{2}-\frac{1}{3}+\frac{1}{3}-\frac{1}{4}+\frac{1}{4}-\frac{1}{5}+\frac{1}{5}-\frac{1}{6}$

$S=\frac{1}{1}-\frac{1}{6}=\frac{6-1}{6}=\frac{5}{6}$

(65

- $A=\frac{(-4)^2(-25)^3}{36\times10^2}=\frac{(4)^2(-1)^3(25)^3}{6^2\times(2\times5)^2}=\frac{2^4(-1)^3(5^2)^3}{(2\times3)^2\times2^2\times5^2}=\frac{-2^4\times5^6}{2^4\times3^2\times5^2}=\frac{-5^4}{3^2}=\frac{-625}{9}$.
- $B=\frac{6\sqrt{288}\times\sqrt{75}}{\sqrt{90}\times\sqrt{20}}=\frac{2\times3\sqrt{2^5\times3^2}\times\sqrt{3\times5^2}}{\sqrt{9\times10}\times\sqrt{2\times10}}$

$B=\frac{2^3\times3^2\sqrt{2}\times5\sqrt{3}}{3\sqrt{10}\times\sqrt{2}\times\sqrt{10}}=\frac{2^3\times3\times5\sqrt{3}}{10}=\frac{2^3\times3\times5\sqrt{3}}{2\times5}=12\sqrt{3}$.

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(66

- $\frac{48}{75}=\frac{2^4\times 3}{3\times 5^2}=\frac{16}{25}$.
- $\frac{180}{126}=\frac{2^2\times 3^2\times 5}{2\times 3^2\times 7}=\frac{10}{7}$.
- $\frac{585}{1275}=\frac{3^2\times 5\times 13}{3\times 5^2\times 17}=\frac{3\times 13}{5\times 17}=\frac{39}{85}$.
- $\frac{17303}{792}=\frac{11^3\times 13}{2^3\times 3^2\times 11}=\frac{11^2\times 13}{2^3\times 3^2}=\frac{1573}{72}$.

(67 [illegible] $\sqrt{74}$ [illegible] $\sqrt{74}$ [illegible] $\sqrt{b}$ [illegible] 74 [illegible]

. $\sqrt{84}$ [illegible]

- $\sqrt{54}=\sqrt{2\times 3^3}=3\sqrt{2\times 3}=3\sqrt{6}$.
- $\sqrt{84}=\sqrt{2^2\times 3\times 7}=2\sqrt{3\times 7}=2\sqrt{21}$.
- $\sqrt{845}=\sqrt{5\times 13^2}=13\sqrt{5}$.
- $\sqrt{1000}=\sqrt{2^3\times 5^3}=2\times 5\sqrt{2\times 3}=10\sqrt{10}$.
- $\sqrt{20825}=\sqrt{17\times 35^2}=35\sqrt{17}$.

(68

- $330=2\times 3\times 5\times 11$.
- $252=2^2\times 3^2\times 7$.
- $\frac{330}{252}=\frac{2\times 3\times 5\times 11}{2^2\times 3^2\times 7}=\frac{5\times 11}{2\times 3\times 7}=\frac{55}{42}$.
- $\sqrt{252}=\sqrt{2^2\times 3^2\times 7}=2\times 3\sqrt{7}=6\sqrt{7}$.



---

69) [illegible] $A=2^3\times 5^2\times 7$ [illegible] 24 [illegible]

.28 [illegible]

- $A=2^3\times 5^2\times 7=2^2\times 2\times 5^2\times 7=2^2\times 7\times 2\times 5^2=28\times 50$

.A [illegible] 28 [illegible]

[illegible] $2^p\times 5^q\times 7^r$ [illegible] p, q [illegible] kA [illegible]

.[illegible]

- $A=2^3\times 5^2\times 7\Leftrightarrow kA=2^4\times 5^2\times 7^2\Leftrightarrow k=\frac{2^4\times 5^2\times 7^2}{2^3\times 5^2\times 7}=2\times 7=14$.

.14 [illegible] k [illegible]

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$kA = 2^4 \times 5^2 \times 7^2 = 19600 \Leftrightarrow \sqrt{kA} = \sqrt{19600} = 140$:ﺎﻨﻴﻠﻋ

(ﺔﻴﻠﻛ) kA ﻦﻣ μA ﻞﻌﺠﻧ p ﻞﻴﻗأ $2^p \times 5^q \times 7^r$ ﻰﻠﻋ A ﺪﻳﺪﺠﻟا ﻞﻌﺠﻧ ﻚﻟﺬﻛ mA ﻰﻠﻋ A ﻞﺼﺤﻧ ﻰﺘﺣ

.3 ﻰﻟإ ﺔﻤﺴﻘﻨﻣ kA ﻞﻌﺠﻧ

- $A = 2^3 \times 5^2 \times 7 \Leftrightarrow mA = 2^3 \times 5^3 \times 7^3 \Leftrightarrow m = \dfrac{2^3 \times 5^3 \times 7^3}{2^3 \times 5^2 \times 7} = 5 \times 7^2 = 245$.

.245 ﻮﻫ μA ﻦﻣ m ﻞﻌﺠﻳ ﻱﺬﻟا

$mA = 2^3 \times 5^3 \times 7^3 = 343000 \Leftrightarrow \sqrt[3]{mA} = \sqrt[3]{343000} = 70$:ﺎﻨﻴﻠﻋ

$f_n = 2^{2^n} + 1$ (70

3	2	1	0	n
257	17	5	3	f_n

- ﺔﻴﻠﻛ kA ﻦﻣ $A1$ ﻞﻌﺠﻳ ﻱﺬﻟا ﻲﻟﻷا ﻲﺑﻮﻠﻄﻤﻟا ﻊﺑاﺮﻟا ﺪﻳﺪﺤﺘﺑ ﻢﻗ.
- $f_5 = 2^{2^5} + 1 = 2^{32} + 1 = 4294967297 = 641 \times 6700417$ ﻦﻣ A ﻞﻌﺠﻳ ﻱﺬﻟا ﻲﻟﻷا ﻲﺑﻮﻠﻄﻤﻟا ﻊﺑاﺮﻟا ﺪﻳﺪﺤﺘﺑ ﻢﻗ .641 ﻰﻠﻋ ﻲﻟﻷا

$2^n - 1$ (71

7	5	3	2	1	0	n
127	31	7	3	1	0	$2^n - 1$

- ﺔﻴﻠﻛ kA ﻦﻣ $A1$ ﻞﻌﺠﻳ ﻱﺬﻟا ﻲﻟﻷا ﻲﺑﻮﻠﻄﻤﻟا ﻊﺑاﺮﻟا ﺪﻳﺪﺤﺘﺑ ﻢﻗ.
- $2^{11} - 1 = 2047 = 23 \times 89$ ﻦﻣ $A1$ ﻞﻌﺠﻳ ﻱﺬﻟا ﻲﻟﻷا ﻲﺑﻮﻠﻄﻤﻟا ﻊﺑاﺮﻟا ﺪﻳﺪﺤﺘﺑ ﻢﻗ ﺔﻴﻠﻛ kA ﻰﻠﻋ ﻲﻟﻷا ﻲﺑﻮﻠﻄﻤﻟا ﻊﺑاﺮﻟا ﺪﻳﺪﺤﺘﺑ ﻢﻗ ﻚﻟﺬﻛ ﻰﻠﻋ ﻲﻟﻷا ﻲﺑﻮﻠﻄﻤﻟا ﻊﺑاﺮﻟا ﺪﻳﺪﺤﺘﺑ ﻢﻗ .$2^n - 1$ ﻦﻣ

(72

- $\text{pgcd}(45;105) = 15$.
- $\dfrac{45}{105} = \dfrac{15 \times 3}{15 \times 7} = \dfrac{3}{7}$
- $\sqrt{45} = \sqrt{3^2 \times 5} = 3\sqrt{5}$.
- $45 \times 105 = 3^2 \times 5 \times 3 \times 5 \times 7 = 3^3 \times 5^2 \times 7$.
- $45^4 = (3^2 \times 5)^4 = 3^8 \times 5^4$.
- $105^3 = (3 \times 5 \times 7)^3 = 3^3 \times 5^3 \times 7^3$.

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(73

- pgcd(420;378) :

pgcd(420;378) = 42

- $420 \div 42 = 10$ $378 \div 42 = 9$

(74

- $A^2 = 4^3 \times 15^4 \times 11^2 = (2^2)^3 \times (3\times 5)^4 \times 11^2 = 2^6 \times 3^4 \times 5^4 \times 11^2$.
- $A^2 = 2^6 \times 3^4 \times 5^4 \times 11^2 \Leftrightarrow A = \sqrt{2^6 \times 3^4 \times 5^4 \times 11^2} = \sqrt{(2^3 \times 3^2 \times 5^2 \times 11)^2} = 2^3 \times 3^2 \times 5^2 \times 11$

(75

- $240 \times n$:

$240 = 2^4 \times 3 \times 5$:

$n = 3\times 5 = 15$:

$240 \times n = 2^4 \times 3 \times 5 \times 3 \times 5 = 2^4 \times 3^2 \times 5^2 = (2^2 \times 3 \times 5)^2$.



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[illegible]

[illegible]

:[illegible]

. [illegible] $p = 2^{3021377} - 1$ [illegible] 909 526 [illegible] (76

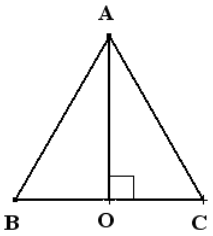
.2 [illegible] ABC (77

.[BC] [illegible] [AO] [illegible]

[illegible] [AO] [illegible] ABC [illegible]

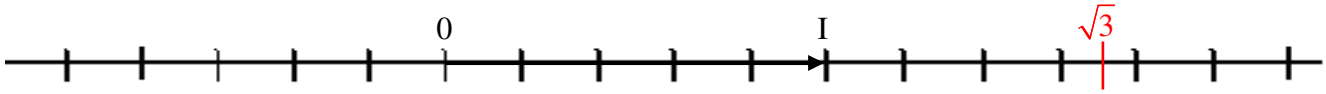
.[illegible]

: [illegible] AOC [illegible]



$$AO^2 = AC^2 - OC^2 = 2^2 - 1^2 = 4 - 1 = 3$$

$$AO^2 = 3 \Leftrightarrow AO = \sqrt{3}$$



- $39 = 3 \times 13$

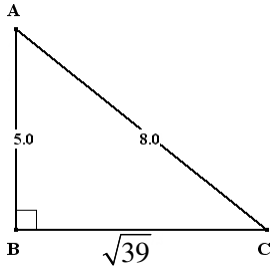
$$\left.\begin{array}{l} 39 = (a-b)\times(a+b) \\ 39 = 3\times 13 \end{array}\right\} \Leftrightarrow \begin{cases} a-b=3 \\ a+b=13 \end{cases} \Leftrightarrow \begin{cases} a=8 \\ b=5 \end{cases}$$

- $39 = (8-5)\times(8+5) = 8^2 - 5^2 \Leftrightarrow \sqrt{39} = \sqrt{8^2 - 5^2}$

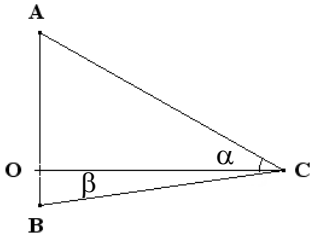
[illegible] 8cm [illegible] $\sqrt{39}$ [illegible]

. $\sqrt{39}$ [illegible] cm





(78



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- $\tan\alpha = \frac{AO}{OC} \Leftrightarrow AO = \tan\alpha \times OC = \tan 30° \times 64{,}3 = 0{,}577 \times 64{,}3 = 37{,}1\,m$.
- $\tan\beta = \frac{OB}{OC} \Leftrightarrow OB = \tan\beta \times OC = \tan 2{,}45° \times 64{,}3 = 0{,}042 \times 64{,}3 = 2{,}7\,m$.
- $AC = AO + OB = 37{,}1 + 2{,}7 = 39{,}8 \approx 40\,m$.

[illegible] $40\,m$.

(79

- [illegible] R1 [illegible] L [illegible] 1.
- [illegible] R2 [illegible] L-1.
- [illegible] R2 [illegible] R1: $\boxed{\frac{L}{1} = \frac{1}{L-1}}$.

- $c = \frac{L}{l} \Leftrightarrow L = c \times l$

$$\frac{L}{l} = \frac{l}{L-l} \Leftrightarrow \frac{c\times l}{l} = \frac{l}{c\times l - l}$$
$$\Leftrightarrow (c\times l)(c\times l - l) = l^2$$
$$\Leftrightarrow c^2\times l^2 - c\times l^2 = l^2$$
$$\Leftrightarrow l^2(c^2 - c) = l^2$$
$$\Leftrightarrow c^2 - c = \frac{l^2}{l^2}$$
$$\Leftrightarrow c^2 - c = 1 \Leftrightarrow c^2 - c - 1 = 0$$

- $\left(c - \frac{1}{2}\right)^2 = \frac{5}{4} \Leftrightarrow c^2 + \frac{1}{4} - 2\times\frac{1}{2}\times c = \frac{5}{4} \Leftrightarrow c^2 + \frac{1}{4} - c - \frac{5}{4} = 0 \Leftrightarrow c^2 - c - 1 = 0 \Leftrightarrow 0 = 0$

[illegible].

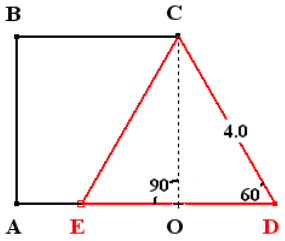
- $\left(c - \frac{1}{2}\right)^2 = \frac{5}{4} \Leftrightarrow \left(c - \frac{1}{2}\right)^2 - \left(\frac{\sqrt{5}}{2}\right)^2 = 0 \Leftrightarrow \left[\left(c - \frac{1}{2}\right) - \frac{\sqrt{5}}{2}\right]\left[\left(c - \frac{1}{2}\right) + \frac{\sqrt{5}}{2}\right] = 0$

$$\Leftrightarrow \begin{cases} \left(c - \frac{1}{2}\right) - \frac{\sqrt{5}}{2} = 0 \\ \left(c - \frac{1}{2}\right) + \frac{\sqrt{5}}{2} = 0 \end{cases} \Leftrightarrow \begin{cases} c - \frac{1}{2} = \frac{\sqrt{5}}{2} \\ c - \frac{1}{2} = -\frac{\sqrt{5}}{2} \end{cases} \Leftrightarrow \begin{cases} c = \frac{1}{2} + \frac{\sqrt{5}}{2} \\ c = \frac{1}{2} - \frac{\sqrt{5}}{2} \end{cases} \Leftrightarrow \begin{cases} c = \frac{1+\sqrt{5}}{2} \\ c = \frac{1-\sqrt{5}}{2} \end{cases}$$

[illegible] $\frac{1+\sqrt{5}}{2} > 0$.

[illegible]: $1 < \sqrt{5} \Leftrightarrow 1 - \sqrt{5} < 0 \Leftrightarrow \frac{1-\sqrt{5}}{2} < 0$ [illegible]: $c = \frac{1+\sqrt{5}}{2}$.

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(80 ABCD شبه منحرف قاعدته [CD] حيث: $\widehat{D} = 60°$ و $CD = 4cm$.
- المثلث CDE متقايس الأضلاع حيث $CD = DE = EC = 4cm$.
- [EO] ارتفاع المثلث CDE و O منتصف [ED].

- المثلث CDE متقايس الأضلاع و [CO] ارتفاع و متوسط له في نفس الوقت: $EO = OD = 2cm$.
- المثلث COD قائم في O و [ED] قطر الدائرة المحيطة به و [CO] وتر له: $CD^2 = CO^2 + OD^2$ ومنه $CO^2 = CD^2 - OD^2 = 4^2 - 2^2 = 16 - 4 = 12$ و $CO = 3,4\ cm$.
- ABCO مستطيل لأن $\widehat{A} = \widehat{B} = \widehat{O} = 90°$ و $AB = CO = 3,4cm$ و $BC = AO$.
- P1 محيط المثلث CDE حيث $P1 = CD+DE+EC = 12cm$.
- P2 محيط الشكل ABCE.

- $P2 = AB + BC + CE + AE$
  $P2 = AB + AO + CE + AE$
  $P2 = 3,4 + AE + 2 + 4 + AE$
  $P2 = 2AE + 9,4$



- $P1 = P2 \Leftrightarrow P2 = 12 \Leftrightarrow 2AE + 9,4 = 12 \Leftrightarrow 2AE = 12 - 9,4 = 2,6 \Leftrightarrow AE = 1,3cm$.

(81 ABC مثلث قائم في A حيث: $BC = a;\ AC = b;\ AB = c$.

- S1 مساحة المثلث ABC: $S1 = \frac{bc}{2}$.
- S2 مساحة نصف الدائرة التي قطرها [AB]: $S2 = \frac{\pi \times \left(\frac{c}{2}\right)^2}{2} = \frac{\pi \times \frac{c^2}{4}}{2} = \frac{\pi \times c^2}{8}$.
- S3 مساحة نصف الدائرة التي قطرها [BC]: $S3 = \frac{\pi \times \left(\frac{a}{2}\right)^2}{2} = \frac{\pi \times \frac{a^2}{4}}{2} = \frac{\pi \times a^2}{8}$.
- S4 مساحة نصف الدائرة التي قطرها [AC]: $S4 = \frac{\pi \times \left(\frac{b}{2}\right)^2}{2} = \frac{\pi \times \frac{b^2}{4}}{2} = \frac{\pi \times b^2}{8}$.
- S مساحة الشكل المحصور:

$$S = S1 + S2 + S4 - S3 = \frac{bc}{2} + \frac{\pi \times c^2}{8} + \frac{\pi \times b^2}{8} - \frac{\pi \times a^2}{8} = \frac{4bc + \pi(c^2 + b^2 - a^2)}{8}.$$

- المثلث ABC قائم في A و $BC^2 = AB^2 + AC^2 \Leftrightarrow a^2 = c^2 + b^2$ حسب فيثاغورس:

$$S = \frac{4bc + \pi(a^2 - a^2)}{8} = \frac{4bc}{8} = \frac{bc}{2}.$$

- S تساوي مساحة المثلث ABC.

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