

ΥΠΟΥΡΓΕΙΟ ΠΑΙΔΕΙΑΣ ΚΑΙ ΠΟΛΙΤΙΣΜΟΥ
ΔΙΕΥΘΥΝΣΗ ΑΝΩΤΕΡΗΣ ΚΑΙ ΑΝΩΤΑΤΗΣ ΕΚΠΑΙΔΕΥΣΗΣ
ΥΠΗΡΕΣΙΑ ΕΞΕΤΑΣΕΩΝ

ΠΑΓΚΥΠΡΙΕΣ ΕΞΕΤΑΣΕΙΣ 2008

Μάθημα: ΜΑΘΗΜΑΤΙΚΑ ΚΟΙΝΟΥ ΚΟΡΜΟΥ

Ημερομηνία και ώρα εξέτασης: Σάββατο, 7 Ιουνίου 2008

7:30 – 10:30

ΛΥΣΕΙΣ

ΜΕΡΟΣ Α'		
1.	$V = \frac{\pi R^2 u}{3} = \frac{\pi 5^2 9}{3} = 75\pi \text{ cm}^3$	
2.	$24 \cdot \frac{25}{100} = 6 \text{ μαθητές}$	
3.	$T = \frac{K \cdot E \cdot X}{100} = \frac{6000 \cdot 5 \cdot 3}{100} = \text{€}900$ $K + T = 6000 + 900 = \text{€}6900$	
4.	(α) $\Omega = \{KK, K\Gamma, \Gamma K, \Gamma\Gamma\}$ (β) $P(A) = \frac{N(A)}{N(\Omega)} = \frac{2}{4} = \frac{1}{2}$	
5.	12, 14, 14, 15, 16, 18, 18, 18 (α) $\chi_{\varepsilon} = 18$ (β) $\chi_{\delta} = \frac{15+16}{2} = 15,5$	
6.	$P(B) = 1 - P(B') = 1 - \frac{3}{4} = \frac{1}{4}$ $P(A \cup B) = P(A) + P(B) - P(A \cap B)$ $P(A \cup B) = \frac{2}{3} + \frac{1}{4} - \frac{1}{6} = \frac{3}{4}$	

7.

εκατοντάδες	δεκάδες	μονάδες
5	6	6

Αρχή Απαρίθμησης:
 $\Rightarrow 5 \cdot 6 \cdot 6 = 180$ αριθμοί

8.

(α)

$$\frac{50}{360} \cdot \chi = 10000 \Rightarrow \chi = 72000 \text{ m}^3$$

Πάφος: $\frac{60^\circ}{360^\circ} \cdot 72000 = 12000 \text{ m}^3$

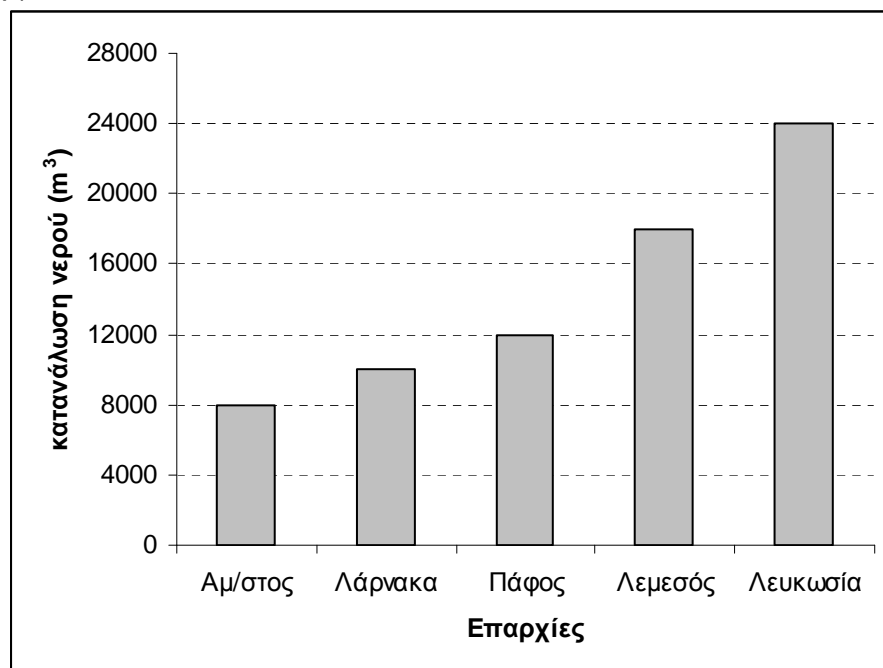
Λεμεσός: $\frac{90^\circ}{360^\circ} \cdot 72000 = 18000 \text{ m}^3$

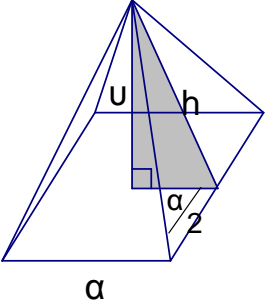
Λευκωσία: $\frac{120^\circ}{360^\circ} \cdot 72000 = 24000 \text{ m}^3$

Αμμόχωστος: $360^\circ - (60^\circ + 90^\circ + 120^\circ + 50^\circ) = 40^\circ$

$$\frac{40^\circ}{360^\circ} \cdot 72000 = 8000 \text{ m}^3$$

β)

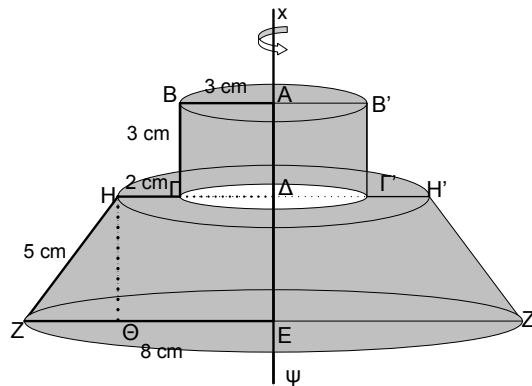


<p>9.</p>	<p>(α) $E_{\beta} = \alpha^2 = 100 \Rightarrow \alpha = 10\text{cm}$</p> <p>(β) $E_{\pi} = \frac{\Pi_{\beta} \cdot h}{2}$ $\Rightarrow 260 = \frac{40 \cdot h}{2} \Rightarrow h = 13\text{ cm}$</p> <p>(γ) $h^2 = u^2 + \left(\frac{\alpha}{2}\right)^2 \Rightarrow u^2 = 13^2 - 5^2 = 144$ $\Rightarrow u = 12\text{cm}$</p> <p>$V = \frac{E_{\beta} \cdot u}{3} = \frac{100 \cdot 12}{3} = 400\text{ cm}^3$</p> 	
<p>10.</p>	<p>$12 \cdot V_{\text{κύβου}} = V_{\text{ορθ.παρ/δου}} = 8 \cdot 6 \cdot 2 = 96\text{ cm}^3$</p> <p>$\Rightarrow V_{\text{κύβου}} = 8\text{ cm}^3$</p> <p>$\Rightarrow \alpha^3 = 8$</p> <p>$\Rightarrow \alpha = 2\text{ cm}$</p>	
ΜΕΡΟΣ Β'		
<p>1.</p>	<p>(α) $\frac{115}{100} \cdot x = 15640 \Rightarrow x = \text{€}13600$</p> <p>Φ.Π.Α. = $15640 - 13600 = \text{€}2040$</p> <p>(β) Κέρδος: $\frac{36}{136} \cdot 13600 = \text{€}3600$</p> <p>(γ) Κόστος αυτοκινήτου : $13600 - 3600 = \text{€}10000$</p> <p>(δ) $\frac{80}{100} \cdot x = 15640 \Rightarrow x = \text{€} 19550$</p>	

2.	<p>α) $\binom{15}{5} = 3003$</p> <p>β) $\binom{13}{4} \cdot \binom{2}{1} = 1430$</p> <p>γ) $\binom{13}{3} = 286$</p>																																									
3.	<p>α)</p> <table border="1" data-bbox="370 625 1317 1014"> <thead> <tr> <th>x_i</th> <th>f_i</th> <th>$x_i f_i$</th> <th>$(x_i - \bar{x})^2$</th> <th>$f_i (x_i - \bar{x})^2$</th> </tr> </thead> <tbody> <tr> <td>3</td> <td>10</td> <td>30</td> <td>9</td> <td>90</td> </tr> <tr> <td>4</td> <td>0</td> <td>0</td> <td>4</td> <td>0</td> </tr> <tr> <td>5</td> <td>50</td> <td>250</td> <td>1</td> <td>50</td> </tr> <tr> <td>6</td> <td>80</td> <td>480</td> <td>0</td> <td>0</td> </tr> <tr> <td>7</td> <td>40</td> <td>280</td> <td>1</td> <td>40</td> </tr> <tr> <td>8</td> <td>20</td> <td>160</td> <td>4</td> <td>80</td> </tr> <tr> <td></td> <td>$\Sigma f_i = 200$</td> <td>$\Sigma x_i f_i = 1200$</td> <td></td> <td>$\Sigma f_i (x_i - \bar{x})^2 = 260$</td> </tr> </tbody> </table> <p>β) $\bar{x} = \frac{\Sigma x_i f_i}{\Sigma f_i} = \frac{1200}{200} = 6$</p> <p>$\sigma = \sqrt{\frac{\Sigma f_i (x_i - \bar{x})^2}{\Sigma f_i}} = \sqrt{\frac{260}{200}} = \sqrt{1,3} = 1,14$</p> <p>γ) $P(A) = \frac{80}{200} = \frac{2}{5}$</p> <p>$P(B) = \frac{60}{200} = \frac{3}{10}$</p>	x_i	f_i	$x_i f_i$	$(x_i - \bar{x})^2$	$f_i (x_i - \bar{x})^2$	3	10	30	9	90	4	0	0	4	0	5	50	250	1	50	6	80	480	0	0	7	40	280	1	40	8	20	160	4	80		$\Sigma f_i = 200$	$\Sigma x_i f_i = 1200$		$\Sigma f_i (x_i - \bar{x})^2 = 260$	
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4.	<p>ΚΥΡΙΑΚΟΣ</p> <p>$M_8^\epsilon = \frac{8!}{2!} = \frac{40320}{2} = 20160$</p> <p>α)</p> <p>i. $M_7 = 7! = 5040$</p> <p>ii. $M_6^\epsilon = \frac{6!}{2!} = \frac{720}{2} = 360$</p> <p>iii. $M_5 \cdot M_4^\epsilon = 5! \cdot \frac{4!}{2!} = 1440$</p> <p>β) $P(\beta) = \frac{5040}{20160} = \frac{1}{4}$</p>																																									

5.

Κύλινδρος Κόλ. κώνος
 $R_1 = 3 \text{ cm}$ $R_2 = 8 \text{ cm}$
 $u_1 = 3 \text{ cm}$ $\rho_2 = 5 \text{ cm}$
 $\lambda = 5 \text{ cm}$



$$ZH = ZE - \Delta H = 8 - 5 = 3 \text{ cm}$$

$$u_2 = H\Theta = \sqrt{25 - 9} = \sqrt{16} = 4 \text{ cm}$$

$$E_{\text{ολ}} = E_{\text{AB}} + E_{\text{B}\Gamma} + E_{\text{GH}} + E_{\text{HZ}} + E_{\text{ZE}}$$

$$= E_{\text{κυκλου}} + E_{\text{κ.κυλ}} + E_{\text{δακτ}} + E_{\text{κ.κολ.κων}} + E_{\text{κυκλου}}$$

$$E_{\text{ολ}} = \pi R_1^2 + 2\pi R_1 u_1 + \pi(\rho_2^2 - R_1^2) + \pi(R_2 + \rho_2) \cdot \lambda + \pi R_2^2$$

$$E_{\text{ολ}} = \pi 3^2 + 2\pi 3 \cdot 3 + \pi(5^2 - 3^2) + \pi(5 + 8)5 + \pi 8^2$$

$$E_{\text{ολ}} = 9\pi + 18\pi + 16\pi + 65\pi + 64\pi = 172\pi \text{ cm}^2$$

$$V_{\text{στ}} = V_{\text{κυλ}} + V_{\text{κολ.κων}}$$

$$V_{\text{στ}} = \pi R_1^2 u_1 + \frac{\pi u_2}{3} (\rho_2^2 + \rho_2 R_2 + R_2^2)$$

$$V_{\text{στ}} = \pi 3^2 \cdot 3 + \frac{\pi \cdot 4}{3} (5^2 + 5 \cdot 8 + 8^2)$$

$$V_{\text{στ}} = 27\pi + 172\pi = 199\pi \text{ cm}^3$$

ΤΕΛΟΣ