



# education

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Department:  
Education  
**REPUBLIC OF SOUTH AFRICA**

**FET MATHEMATICS – GRADE 10**

## **MARKING MEMO**

**MATHEMATICS – P2**

**OCTOBER/NOVEMBER 2006**

<p>Question 1</p>	
<p>1.1.1 <math>m_{AB} = \frac{y_2 - y_1}{x_2 - x_1} \checkmark</math>      <math>m_{DC} = \frac{y_2 - y_1}{x_2 - x_1}</math>  <math>= \frac{4 - 2}{1 - (-3)} \checkmark</math>      <math>= \frac{0 - (-2)}{3 - (-1)} \checkmark</math>  <math>= \frac{2}{4}</math>      <math>= \frac{2}{4}</math>  <math>= \frac{1}{2} \checkmark</math>      <math>= \frac{1}{2} \checkmark</math></p>	<p><math>\checkmark</math> one mark each for formula  <math>\checkmark</math> one mark each for correct substitution</p>
<p>1.1.2 <math>AB = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2} \checkmark</math>  <math>= \sqrt{(1 - (-3))^2 + (4 - 2)^2} \checkmark</math>  <math>= \sqrt{16 + 4}</math>  <math>= \sqrt{20} \checkmark</math></p>	<p><math>\checkmark</math> one mark each for final answer  <math>\checkmark</math> one mark for formula</p>
<p><math>CD = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}</math>  <math>= \sqrt{(-1 - 3)^2 + (-2 - 0)^2} \checkmark</math>  <math>= \sqrt{16 + 4}</math>  <math>= \sqrt{20} \checkmark</math></p>	<p><math>\checkmark</math> one mark for correct substitution  <math>\checkmark</math> one mark for final answer</p>
<p>1.1.3 <math>m_{AC} = \frac{y_2 - y_1}{x_2 - x_1}</math>      <math>m_{BD} = \frac{y_2 - y_1}{x_2 - x_1}</math>  <math>= \frac{0 - 2}{3 - (-3)} \checkmark</math>      <math>= \frac{-2 - 4}{-1 - 1} \checkmark</math>  <math>= \frac{-2}{6}</math>      <math>= \frac{-6}{-2}</math>  <math>= -\frac{1}{3} \checkmark</math>      <math>= \frac{3}{1} \checkmark</math></p>	<p><math>\checkmark</math> one mark for correct substitution  <math>\checkmark</math> one mark for final answer</p>
<p>1.3 Rhombus <math>\checkmark</math>   <math>AB = DC</math> and <math>AB \parallel DC</math>. Therefore ABCD is a parallelogram <math>\checkmark</math>          But the gradients are perpendicular to each other. Therefore ABCD is a rhombus <math>\checkmark</math></p>	<p><math>\checkmark</math> one mark each for correct substitution  <math>\checkmark</math> one mark each for final answer  <math>\checkmark</math> one mark for stating rhombus  <math>\checkmark</math> one mark each for statements as indicated</p>

Question 2

2.1 Volume of a right rect. prism =  $l \times b \times h$  ✓ = 36 000 ✓  
 $30 \times 20 \times h = 36\ 000$  ✓  
 $h = 36\ 000 \div 600$  ✓  
 $= 60\text{ cm}$  ✓

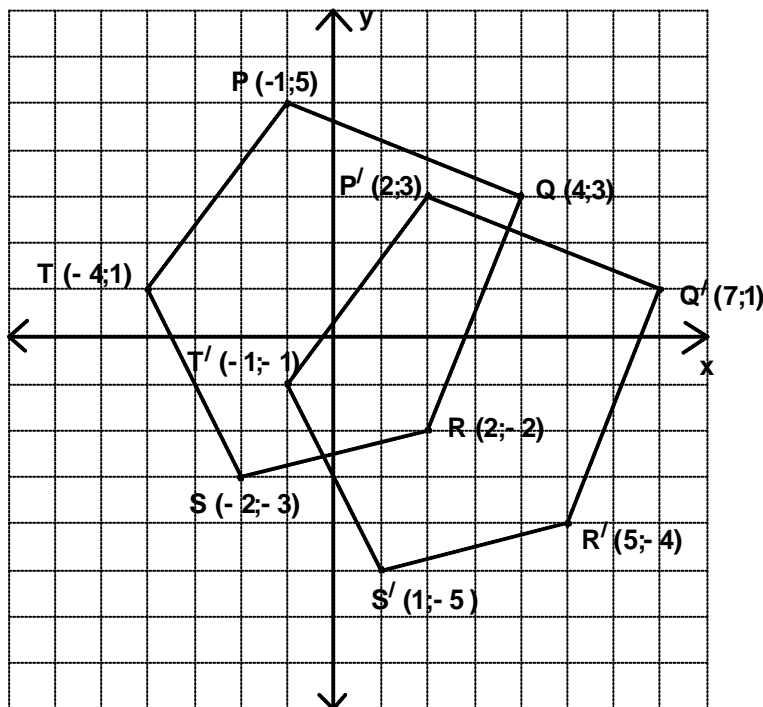
∴ the height of the tank should be 60 cm.

2.2 Multiplying both length and breadth by 2 will increase the volume by 4 times ✓.

$$\begin{aligned} V &= 2 \times L \times 2 \times B \times H \\ &= 4 (L \times B \times H) \checkmark \\ &= 60 \times 40 \times 60 \checkmark \\ &= 144\ 000 \checkmark \end{aligned}$$

✓ one mark for formula  
 ✓ one mark for substituting for l and b  
 ✓ one mark for division  
 ✓ one mark for answer  
  
 ✓ one mark for saying 4  
  
 ✓ one mark for 4 (L x B x H)  
 ✓ one mark for multiplication  
 ✓ one mark for answer

Question 3



3.1

3.2.1 midpoint of AC (E) =  $\left( \frac{x_1 + x_2}{2}; \frac{y_1 + y_2}{2} \right)$  ✓  
 $= \left( \frac{0 + (-1)}{2}; \frac{4 + (-1)}{2} \right)$  ✓ ✓

✓✓✓✓✓ one accuracy mark each for the plotting of each point on PQRST  
 ✓✓✓✓✓ one consistent accuracy mark each for the plotting of points on P' Q' R' S' T' together with the correct coordinates.

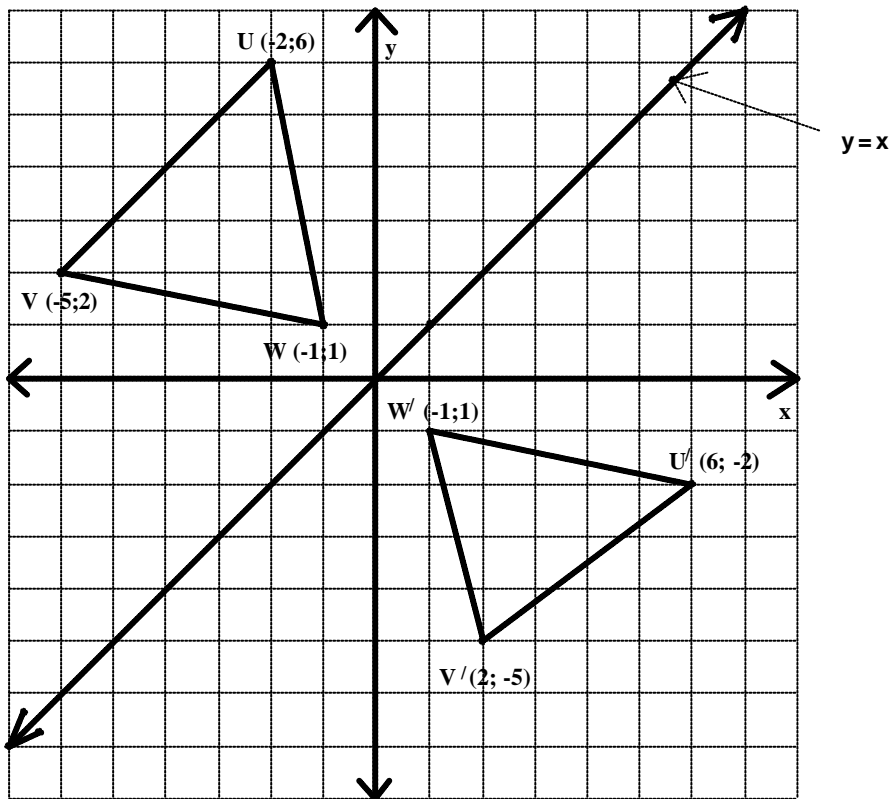
$$= \left( -\frac{1}{2}; \frac{3}{2} \right)$$

Remember that the midpoint of BD can be found as well. Mark distribution is similar.

3.2.2 ABCD moves  $5\frac{1}{2}$  units to the right. ✓

3.2.3 A (5;4) ✓✓, C (4;-1) ✓✓

3.3



✓ one mark for knowing to use the midpoint formula

✓ one mark each for substitution into both parts of the coordinate

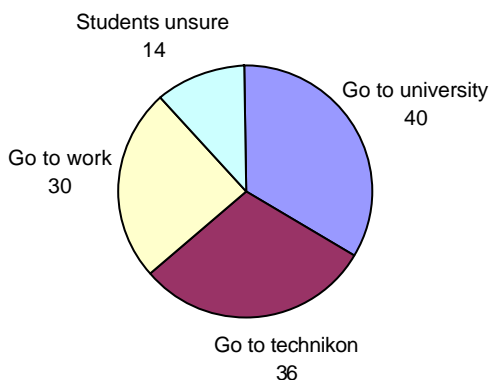
✓ one mark for  $5\frac{1}{2}$  and ✓ one mark for stating to the right  
 ✓✓ two marks for A and ✓✓ two marks for C

✓✓✓ one mark each for coordinates

✓✓✓ one mark each for the correct positioning of coordinates on diagram

<p>Question 4</p> <p>4.1 <math>\tan P = \frac{22}{37} \checkmark</math>  <math>P = 30,7^{\circ} \checkmark\checkmark</math></p> <p>4.2 <math>\tan 30^{\circ} = \frac{RQ}{15} \checkmark</math>  <math>RQ = 15 \times \tan 30^{\circ} = 8.7 \text{ m} \checkmark</math>  <math>\cos 30^{\circ} = \frac{15}{RP'} \checkmark \Rightarrow RP' = 17.3 \text{ m} \checkmark</math>  the height of pole PQ = <math>8.7 + 17.3 = 26 \text{ m} \checkmark</math></p>	<p><math>\checkmark</math> one mark for tan ratio  <math>\checkmark</math> one mark for correct answer and  <math>\checkmark</math> one mark for method (use of calculator)  <math>\checkmark</math> one mark for sine ratio</p> <p><math>\checkmark</math> one mark for correct value of RQ  <math>\checkmark</math> one mark for cos ratio  <math>\checkmark</math> one mark for correct value of RP' and <math>\checkmark</math> one mark for correct value of PQ</p>
<p>Question 5</p> <p>5.1.1 <math>\tan 41^{\circ} = \frac{h}{15} \checkmark</math>  <math>h = 15 \tan 41^{\circ} \checkmark = 13.04 \text{ units} \checkmark</math></p> <p>5.1.2 <math>\sin x = \frac{h}{14} \checkmark</math>  <math>\sin x = \frac{13.04}{14} \checkmark</math>  <math>x = \checkmark</math></p> <p>5.2.1 <math>\sin A = \frac{h}{b} \checkmark</math></p> <p>5.2.2 <math>\sin B = \frac{h}{a} \checkmark</math></p> <p>5.2.3 <math>h = b \sin A \checkmark</math> and <math>h = a \sin B \checkmark</math>  <math>b \sin A = a \sin B \checkmark</math></p>	<p><math>\checkmark</math> one mark for substitution  <math>\checkmark</math> one mark for method (cross multiplication) and  <math>\checkmark</math> one mark for answer.</p> <p><math>\checkmark</math> one mark for sin ratio  <math>\checkmark</math> one mark for substitution  <math>\checkmark</math> one mark for answer.</p> <p><math>\checkmark</math> one mark for ratio</p>

$\therefore \frac{\sin A}{a} = \frac{\sin B}{b} \quad \checkmark$ <p>5.2.4 <math display="block">\frac{\sin A}{a} = \frac{\sin B}{b}</math></p> $\frac{\sin A}{32} = \frac{\sin 40^\circ}{25} \quad \checkmark$ $\sin A = \frac{32 \sin 40}{25} \quad \checkmark$ $A = 55,39^\circ \quad \checkmark\checkmark$	<p><math>\checkmark</math> one mark for ratio</p> <p><math>\checkmark</math> one mark each for expressing in terms of h</p> <p><math>\checkmark</math> one mark for equating</p> <p><math>\checkmark</math> one mark for dividing by ab.</p> <p><math>\checkmark</math> one mark for substitution</p> <p><math>\checkmark</math> one mark for making sin A the subject of the formula</p> <p><math>\checkmark\checkmark</math> two marks for the answer</p>															
<p>Question 6</p> <p>6.1</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th style="width: 25%;">Learners</th> <th style="width: 50%;">Percentage on pie graph</th> <th style="width: 25%;">degrees</th> </tr> </thead> <tbody> <tr> <td>University</td> <td><math>\frac{40}{120} \times 100 = 33.33\%</math></td> <td><math>120^\circ</math></td> </tr> <tr> <td>Technikon</td> <td><math>\frac{36}{120} \times 100 = 30\%</math></td> <td><math>108^\circ</math></td> </tr> <tr> <td>Work</td> <td><math>\frac{30}{120} \times 100 = 25\%</math></td> <td><math>90^\circ</math></td> </tr> <tr> <td>Uncertain</td> <td><math>\frac{14}{120} \times 100 = 11.67\%</math></td> <td>42</td> </tr> </tbody> </table>	Learners	Percentage on pie graph	degrees	University	$\frac{40}{120} \times 100 = 33.33\%$	$120^\circ$	Technikon	$\frac{36}{120} \times 100 = 30\%$	$108^\circ$	Work	$\frac{30}{120} \times 100 = 25\%$	$90^\circ$	Uncertain	$\frac{14}{120} \times 100 = 11.67\%$	42	<p><math>\checkmark\checkmark\checkmark\checkmark</math> one mark each for correctly calculating degree of each sector</p>
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Uncertain	$\frac{14}{120} \times 100 = 11.67\%$	42														



√ mark for correct pie graph (HINT: draw the graph on a transparency when marking learners drawing of the pie graph)

√ correct labelling

$$6.2.1 \text{ mean} = \frac{\text{sum of all the times}}{15} = \frac{420}{15} \checkmark$$

$$= 28 \text{ minutes} \checkmark$$

√ one mark for formula / division  
√ one mark for answer

6.2.2 25 25 25 25 25 26 27 27 28 29 30 31 32 32 33

median = 27 √  
mode = 25 √

√ one mark for median  
√ one mark for mode

6.2.3 lower quartile (LQ) mark is the  $\frac{1}{4}(n + 1)$ th mark √

∴ LQ mark is 25 √

upper quartile (UQ) is the  $\frac{3}{4}(n + 1)$ th mark √

∴ UQ mark is 31 √

∴ Inter-quartile range is  $31 - 25 = 6$  minutes √

√ one mark each for formula of LQ and UQ  
√ one mark each for their answer  
√ one mark for IQR

Note : Two marks if they only wrote out the LQ mark

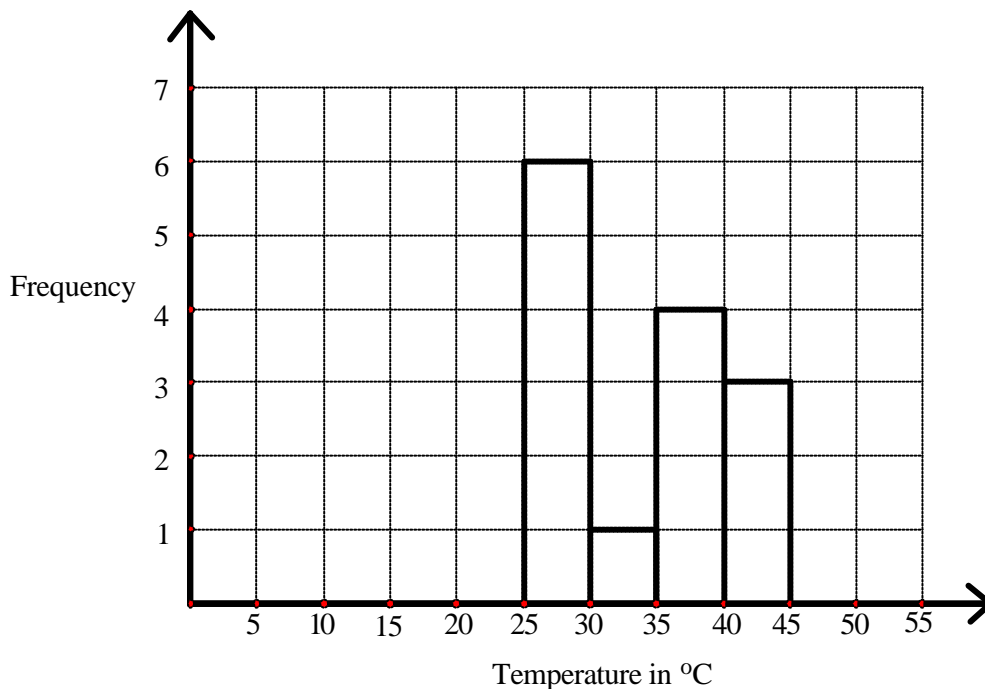
Note :Two marks if they only wrote out the upper quartile mark

6.3.1

Temperature in °C	Frequency
$25 \leq T < 30$	7
$30 \leq T < 35$	0
$35 \leq T < 40$	4
$40 \leq T < 45$	3

√√√ one mark each for each value in table

6.3.2



√√√ one mark for each correct bar

6.2.3 The temperature distribution illustrates a bimodal distribution with two peaks. √√

√√ two marks for recognising that it is not a normal distribution but a bimodal one.