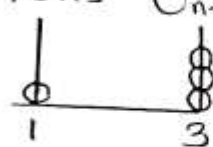
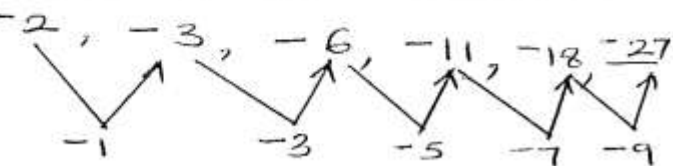


# MTC SPECIAL MOCK GUIDE -2023

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Qn	SOLUTION	M	COMMENT
1.	$12 \div 3 =$ $\begin{array}{r} 0 \quad 4 \\ 3 \overline{) 12} \\ \underline{0 \times 3 = 0} \quad 2 \\ 4 \times 3 = 12 \\ \underline{\phantom{0 \times 3 = 0} 12} \end{array}$ $\therefore 12 \div 3 = 4$	B <sub>2</sub>	Award B <sub>2</sub> for 4.
2.	<p>Eleven thousand = 11,000</p> <p>eleven</p> $\begin{array}{r} \phantom{11,000} \\ + \phantom{11,000} 11 \\ \hline 11,011 \end{array}$	B <sub>2</sub>	Award B <sub>2</sub> for 11,011
3.	$5p - 9d + p + 4d$ $5p + p + 4d - 9d$ $6p - 5d$	m <sub>1</sub> A <sub>1</sub>	Award m <sub>1</sub> for collecting like terms Award A <sub>1</sub> for 6p - 5d
4.	$\frac{2}{3} - \frac{1}{4} \text{ (LCM = 12)}$ $\frac{2 \times 4}{3 \times 4} - \frac{1 \times 3}{4 \times 3} = \frac{8}{12} - \frac{3}{12} = \frac{5}{12}$	m <sub>1</sub> A <sub>1</sub>	Award m <sub>1</sub> for the correct working. Award A <sub>1</sub> for $\frac{5}{12}$
5.	<p><u>Subsets</u></p> <p>{ }, {c}, {a}, {t}, {c,a}, {c,t}, {t,a}, {c,a,t}.</p>	B <sub>2</sub>	Award B <sub>2</sub> for listing all the subsets in Set K correctly. Reject 8 subsets
6.	$9 - 3\gamma > 3$ $9 - 9 - 3\gamma > 3 - 9$ $-3\gamma > -6$ $-\frac{3}{3}\gamma < \frac{-6}{-3}$ $\gamma < 2$	m <sub>1</sub> A <sub>1</sub>	Award m <sub>1</sub> for collecting of like terms. Award A <sub>1</sub> for $\gamma < 2$ or $2 > \gamma$

Q.N	SOLUTION	M	COMMENT																		
7.	$\begin{array}{r} \text{T} \quad \text{O} \quad \text{t} \quad \text{h} \\ 64.97 \\ + 0.1 \\ \hline 65.07 \end{array}$ $\therefore 64.97 \approx 65.0$	$m_1$  $A_1$	Award $m_1$ for correct Working.  Award $A_1$ for 65.0 Reject +1																		
8.	$\begin{array}{r} 6:40 \text{ a.m} \\ + 00:00 \text{ hrs} \\ \hline 06:40 \text{ hrs} \end{array}$	$m_1$  $A_1$	Award $m_1$ for correct Working.  Award $A_1$ for 0640hrs																		
9.	Emphasize the correct measuring of angles using the protractor. "Accept the correct angle got after measuring using a protractor"	$B_2$	Award $B_2$ for the correct angle got after measuring using a protractor.																		
10.	$1 \text{ kg} = 2 \text{ halves}$ $1\frac{1}{2} \text{ kg} = 3 \text{ halves}$ <u>Cost for <math>1\frac{1}{2} \text{ kg}</math> of sugar</u> $\begin{array}{r} \text{Sh. } 2500 \\ \times 3 \\ \hline \text{Sh. } 7500 \end{array}$	$B_1$    $B_1$	Award $B_1$ for 3 halves or for the cost of 1kg as Sh. 5000.    Award $B_1$ for Sh. 7,500.																		
11.	<p>Tens      Ones</p>  <table><tr><th>Base</th><th>No</th><th>Rem</th></tr><tr><td>2</td><td>13</td><td>1</td></tr><tr><td>2</td><td>6</td><td>0</td></tr><tr><td>2</td><td>3</td><td>1</td></tr><tr><td>2</td><td>1</td><td>1</td></tr><tr><td></td><td>0</td><td></td></tr></table> <p><math>\therefore 13_{\text{ten}} = 1101_{\text{two}}</math></p>	Base	No	Rem	2	13	1	2	6	0	2	3	1	2	1	1		0		$m_1$    $A_1$	Award $m_1$ for correct method    Award $A_1$ for $1101_{\text{two}}$
Base	No	Rem																			
2	13	1																			
2	6	0																			
2	3	1																			
2	1	1																			
	0																				
12.	Age = C.Y - Y.O.B $400 - (-500)$ $400 + 500$ 900 years old.	$m_1$  $A_1$	Award $m_1$ for correct Working.  Award $A_1$ for 900																		

Qn	SOLUTION	M	COMMENT												
13.	<table><tr><td>Black</td><td>Blue</td></tr><tr><td>15%</td><td><math>(100-15)\% = 85\%</math></td></tr><tr><td>3</td><td></td></tr></table> $15\% \text{ rept } 3 \text{ pens}$ $1\% \text{ repts } \frac{3}{15}$ $85\% \text{ rept } \left(\frac{3}{15} \times 85\right) \text{ blue pens}$ $\frac{3}{15} \times 85 = 17$ $1 \times 17 \text{ blue pens}$ $17 \text{ blue pens}$	Black	Blue	15%	$(100-15)\% = 85\%$	3		$B_1$       $B_1$	Award $B_1$ for $\frac{3}{15}$ or $\frac{1}{5}$  Award $B_1$ for 17 blue pens.  Accept any other correct working.						
Black	Blue														
15%	$(100-15)\% = 85\%$														
3															
14.		$m_1$  $A_1$	Award $m_1$ for correct working Award $A_1$ for -27												
15.	$\frac{3}{4} \text{ kg to g}$ $1 \text{ kg} = 1000 \text{ g}$ $\frac{3}{4} \text{ kg} = \left(\frac{3}{4} \times 1000\right) \text{ g}$ $\begin{array}{r} 250 \\ \times 3 \\ \hline 750 \end{array}$ $\therefore \frac{3}{4} \text{ kg} = 750 \text{ g}$	  $m_1$   $A_1$	Award $m_1$ for correct working.   Award $A_1$ for 750g.												
16.	Highest number = GCF + Rem <table><tr><td>2</td><td>36</td><td>48</td></tr><tr><td>2</td><td>18</td><td>24</td></tr><tr><td>3</td><td>9</td><td>12</td></tr><tr><td></td><td>3</td><td>4</td></tr></table> $2 \times 2 \times 3 + 0$ $4 \times 3 + 0$ $12 + 0$ $12$ $\therefore$ The highest number of pupils is 12	2	36	48	2	18	24	3	9	12		3	4	  $m_1$   $A_1$	Award $m_1$ for the correct method.   Award $A_1$ for 12
2	36	48													
2	18	24													
3	9	12													
	3	4													
17.	<table><tr><td><math>3p - 10^\circ</math></td><td><math>= 50^\circ</math></td><td rowspan="4"><math>p = 20^\circ</math></td></tr><tr><td><math>3p - 10^\circ + 10^\circ</math></td><td><math>= 50^\circ + 10^\circ</math></td></tr><tr><td><math>3p</math></td><td><math>= 60^\circ</math></td></tr><tr><td><math>\frac{3p}{3}</math></td><td><math>= \frac{60^\circ}{3}</math></td></tr></table>	$3p - 10^\circ$	$= 50^\circ$	$p = 20^\circ$	$3p - 10^\circ + 10^\circ$	$= 50^\circ + 10^\circ$	$3p$	$= 60^\circ$	$\frac{3p}{3}$	$= \frac{60^\circ}{3}$	  $m_1$  $A_1$	Award $m_1$ for correct formation of the equation Award $A_1$ for $p = 20^\circ$			
$3p - 10^\circ$	$= 50^\circ$	$p = 20^\circ$													
$3p - 10^\circ + 10^\circ$	$= 50^\circ + 10^\circ$														
$3p$	$= 60^\circ$														
$\frac{3p}{3}$	$= \frac{60^\circ}{3}$														





QN	SOLUTION	M	COMMENT
21.	$\begin{array}{r} 2 \quad 3 \quad 2 \\ 0 \quad 1 \quad 2 \quad 2 \\ \times \quad \quad \quad 4 \\ \hline 2 \quad 1 \quad 1 \quad 2 \end{array}$ $\frac{8}{3} = 2 \text{ rem } 2$ $\frac{10}{3} = 3 \text{ rem } 1$ $\frac{7}{3} = 2 \text{ rem } 1$	m1 A1	For correct Working For 2112 three
b)	$\begin{array}{r} 77 \quad 7 \quad 0 \\ K \quad 4 \quad 2 \\ \hline \end{array}$ Seven $\begin{array}{r} K \times 7 \times 7 \\ K \times 7 \times 7 \\ \hline 7 \times 7 \end{array} = \begin{array}{r} 147 \\ 147 \\ \hline 7 \times 7 \end{array}$ $K = 3$	m1 A1	Award m1 for correct formation of the equation. Award A1 for K=3
22.	<p>Sketch</p>	S1 h c1 c1	For detailed sketch. For 5.5cm For 120° For 60°
b)	$SQ = 5.6 \text{ cm}$	B1	Accept 5.5cm 5.6cm 5.7cm

Q.N	SOLUTION	M	COMMENT																									
23 a)	<table><tr><td>Th</td><td>H</td><td>T</td><td>O</td><td></td></tr><tr><td>3</td><td>7</td><td>0</td><td>6</td><td></td></tr><tr><td> </td><td></td><td></td><td> </td><td>Ones</td></tr><tr><td>3x1000</td><td></td><td></td><td></td><td></td></tr><tr><td>3000</td><td></td><td></td><td></td><td></td></tr></table> <div><div>Difference</div><div><div>299</div><div>3000</div><div>-</div><div>1</div><div>2999</div></div></div>	Th	H	T	O		3	7	0	6						Ones	3x1000					3000					<div><div>m<sub>1</sub></div><div>A<sub>1</sub></div></div>	<div>Award m<sub>1</sub> for Subtraction</div> <div>Award A<sub>1</sub> for 2999</div>
Th	H	T	O																									
3	7	0	6																									
				Ones																								
3x1000																												
3000																												
b)	<div>78.24 ÷ 10 = 7.824</div> <div>∴ 78.24 = 7.824 × 10<sup>1</sup></div>	<div><div>m<sub>1</sub></div><div>A<sub>1</sub></div></div>	<div>For division</div> <div>For 7.824 × 10<sup>1</sup></div>																									
24. a)	<div>3r + r + 15 + 17 = 60</div> <div>4r + 32 = 60</div> <div>4r + 32 - 32 = 60 - 32</div> <div>4r = 28</div> <div><del>4r</del> = <del>28</del></div> <div><del>4</del> = <del>4</del></div> <div>r = 7</div> <div>Total</div> <div>60 + r - 4</div> <div>60 + 7 - 4</div> <div>60 + 3</div> <div>63 tourists</div>	<div><div>m<sub>1</sub></div><div>A<sub>1</sub></div><div>B<sub>1</sub></div></div>	<div>Award m<sub>1</sub> for correct formation of the equation.</div> <div>Award A<sub>1</sub> for the Value of r = 7</div> <div>Award B<sub>1</sub> for 63</div>																									
b)	<div>Event asked</div> <div>r - 4</div> <div>7 - 4</div> <div>3</div> <div>Probability = <math>\frac{n(D.C)}{n(T.C)}</math></div> <div><math>\frac{3}{63}</math></div>	<div><div>B<sub>1</sub></div><div>B<sub>1</sub></div></div>	<div>Award B<sub>1</sub> for 3</div> <div>Award B<sub>1</sub> for <math>\frac{3}{63}</math></div>																									

Qn	SOLUTION	M	COMMENT
25.	$4L + 4W + 4H = \text{Total length}$ a) $4(\frac{y+3}{12}) + 4(\frac{y}{12}) + 4(\frac{y+1}{12}) = \frac{76y}{12}$ $4y + 12 + 4y + 4y + 4 = 76$ $4y + 4y + 4y + 12 + 4 = 76$ $12y + 16 = 76$ $12y + 16 - 16 = 76 - 16$ $12y = 60$ $\frac{12y}{12} = \frac{60}{12}$ $y = 5$ <u>Actual length</u> $(y+3)m$ $(5+3)m$ $8m$	  	



Q/N	SOLUTION	M	COMMENT
	<u>Total Expenditure</u> Sh. 240,000 Sh. 500,000 + Sh. 320,000 <u>Sh. 860,000</u>	B <sub>1</sub>	Award B <sub>1</sub> for Sh. 860,000
27	a(i) $y = 2 \times 3 \times 3$ $y = 18$	M <sub>1</sub> A <sub>1</sub>	For the correct equation For $y = 18$
11	$k \times 3 \times 2 = 30$ $6k = 30$ $\frac{6k}{6} = \frac{30}{6}$ $k = 5$	M <sub>1</sub> A <sub>1</sub>	For the correct equation For $k = 5$
b)	HCF = Product of $\cap$ $2, 3,$ $2 \times 3$ $6$	B <sub>1</sub>	For 6
28.	$\odot_{42}$ $C = \pi CD$ $C = \frac{22}{7} \times 2r$ $C = \frac{22}{7} \times 2 \times 42$ $C = 22 \times 12$ $C = 264 \text{ cm}$ <u>Length of the pole</u> 264 cm <u>Length from School to Shop</u> $264 \text{ cm} \times 50$ $\begin{array}{r} 2640 \\ \times 5 \\ \hline 13200 \end{array}$ <u>Length in metres</u> $1 \text{ m} = 100 \text{ cm}$ $\begin{array}{r} 13200 \text{ cm} \\ \hline 100 \text{ cm} \\ \hline 132 \text{ metres} \end{array}$	M <sub>1</sub> A <sub>1</sub>  M <sub>1</sub> A <sub>1</sub>  M <sub>1</sub> A <sub>1</sub>	For correct working For 264 cm  For multiplication For 13200 cm  For division. For 132 metres.



Qn	SOLUTION	M	COMMENT
29.			
a)	<p>Speed = Distance <math>\div</math> Time</p> $168\text{km} \div 3\frac{1}{2}\text{hrs}$ $168\text{km} \div \frac{7}{2}\text{hrs}$ $\overset{24}{+68}\text{km} \times \frac{2}{7}\text{hrs}$ $24\text{km} \times \frac{2}{1}\text{hr}$ $48 \frac{\text{km}}{\text{hr}}$	<p>m</p> <p>A1</p>	<p>Award m1 for correct substitution in the formular.</p> <p>Award A1 for 48 km/hr.</p>
b)	<p>4 litres cover <math>\frac{2}{3} \times 48\text{km}</math></p> <p>4 litres cover <math>2 \times 16\text{km}</math></p> <p>4 litres cover <math>32\text{km}</math></p> <p>1 litre covers <math>\frac{32}{4}\text{km}</math></p> <p>1 litre covers <math>8\text{km}</math></p> <p><u>Distance covered in 4hrs</u></p> $\begin{array}{r} S \quad \times \quad T \end{array}$ $\begin{array}{r} 48\text{km} \times 4\text{hrs} \\ \hline 192\text{km} \end{array}$ <p><u>Fuel needed to cover 192km</u></p> <p>8km take 1 litre</p> <p>1km takes <math>\frac{1}{8}</math> litre</p> <p>192km take <math>(\frac{1}{8} \times 192)\text{litres}</math></p> <p><math>1 \times 24\text{litres}</math></p> <p>24 litres</p> <p><math>\therefore 192\text{km}</math> take 24 litres of fuel.</p>	<p>B1</p> <p>B1</p> <p>B1</p>	<p>Award B1 for 8km or <math>\frac{1}{8}</math> litres</p> <p>Award B1 for 192km</p> <p>Award B1 for 24 litres of fuel.</p>



Qn	SOLUTION	M	COMMENT
32.	$\frac{\text{Sum of marks}}{\text{No of pupils}} = \text{Average}$ $\frac{(3 \times 70) + (h \times 40) + (2 \times 30) + (1 \times 90)}{h + 3 + 2 + 1} = 52$ $\frac{210 + 40h + 60 + 90}{h + 6} = 52$ $\frac{(40h + 360) \times h + 6}{h + 6} = 52(h + 6)$ $40h + 360 = 52h + 312$ $40h + 360 - 360 = 52h + 312 - 360$ $40h = 52h - 48$ $40h - 52h = 52h - 52h - 48$ $-12h = -48$ $\frac{-12h}{-12} = \frac{-48}{-12}$ $h = 4$ <p>Total</p> $h + 6$ $(4 + 6) \text{ pupils}$ $10 \text{ pupils}$ <p><math>\therefore</math> 10 pupils did the test.</p> <p style="text-align: center;"><u>END</u></p>	<p>m1</p> <p>m1</p> <p>m1</p> <p>A1</p> <p>m1</p> <p>A1</p>	<p>Award m1 for correct substitution in the formulae.</p> <p>Award m1 for final collecting of like terms.</p> <p>Award A1 for <math>h = 4</math></p> <p>Award m1 for addition.</p> <p>Award A1 for 10 pupils.</p>