

# PRACTICE PAPERS



*Rewarding Learning*

**General Certificate of Secondary Education  
2020**

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## **Mathematics**

Unit M3

**(With calculator)**

Higher Tier

**PRACTICE**

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**MARK  
SCHEME**

- 1**  $118.30 - 7.50 = 110.80$  MA1  
 $110.80 \div 13.85 = 8$  M1A1
- 2**  $69 - 30 = 39$  MA1  
 $2 \times 39 \div 3 = 26$  MA1  
 $60\% \text{ of } 30 = 60 \times 30 \div 100 = 18$  MA1  
 $26 + 18 = 44$  MA1
- 3**  $180 - 114 = 66$  MA1  
 $360 - (66 + 133 + 48) = 113$  M1A1
- 4**  $\frac{7}{12} - \frac{4}{9} = \frac{5}{36}$  MA1  
 $\frac{5}{36} = 15$  MA1  
 $\frac{36}{36} = 15 \div 5 \times 36 = 108$  M1A1
- 5** Angles are  $88^\circ$ ,  $72^\circ$ ,  $168^\circ$  and  $32^\circ$  M1A1  
Each sector correctly drawn and labelled MA2  
(MA1 for 2 correctly drawn and labelled or 4 correctly drawn but missing label(s))
- 6 (a)**  $4 \times 7 = 28$  MA1  
**(b)**  $\frac{1}{2} \times 8.4 \times 11.2 = 47.04$  M1A1
- 7 (a)**  $7x - 21$  MA1  
**(b)**  $13 = 3t - 8$  MA1  
 $3t = 21$  MA1  
 $t = 7$  A1

- 8  $\frac{18}{100} \times 9650 = 1737$  M1A1  
 $9650 - 1737 = 7913$  MA1
- 9  $T = 2.60x + 0.64y$  A1A1
- 10  $7x + 2x = 1 - 4$  MA1  
 $9x = -3$  A1  
 $x = -\frac{1}{3}$  A1
- 11  $74 - 59 = 15$  MA1  
 $\frac{15}{74} \times 100 = 20.27$  M1A1
- 12  $180 - 155 = 25$  MA1  
 $42 + 25 = 67$  M1A1
- 13  $x(7 - 4x)$  MA1
- 14 Area of trapezium =  $\frac{1}{2}(20 + 28) \times h = 24h$  MA1  
Area of semicircle =  $\frac{1}{2} \pi (14)^2 = 307.876$  M1A1  
 $24h + 307.876 = 847.876$  M1  
 $24h = 540$   
 $h = 22.5$  A1
- 15 (a)  $x$  in intersection of B, N and P A1  
 $14 - x$ ,  $11 - x$  and  $20 - x$  in 3 inner sections A1  
 $8 + x$ ,  $18 + x$  and  $13 + x$  in 3 outer sections and 3 outside all circles A1

<b>(b)</b> $87 + x = 100$	M1
$x = 13$	A1
<b>16</b> $6 - 10$	A1
<b>17 (a)</b> $2^3 \times 3^2 \times 5$ or $2 \times 2 \times 2 \times 3 \times 3 \times 5$	M1A1
<b>(b)</b> $2 \times 5 = 10$	M1A1
<b>18</b> $x^2 = 23.8^2 - 14.28^2$	MA1
$x^2 = 362.5216$	MA1
$x = 19.04$	A1
<b>19</b> $v^{11}$	MA1
<b>20</b> $1800 \times 0.85 \div 100 = 15.30$	MA1
$1815.30 \times 0.85 \div 100 = 15.43005$	MA1
$1830.73005 \times 0.85 \div 100 = 15.5612 + 1830.73005 = 1846.291255$	MA1
$1846.29$	A1
ALTERNATIVE	
$1.0085$	MA1
$1800 \times 1.0085^3 = 1846.291255$	M1A1
$1849.29$	A1
<b>21</b> $90 \div 2 = 45$	MA1
$\pi (45)^2 h = 800\,000$	MA1MA1
$h = 125.75$ or $126$	A1

<b>22</b>	<b>(a)</b> 15	A1
	<b>(b)</b> $45 \div 5 = 9$	M1A1
<b>23</b>	Total age = $30 \times 11 = 330$	MA1
	$5 \times 6 + 10 \times 9 = 30 + 90 = 120$	MA1
	$330 - 120 = 210$	MA1
	$210 \div 15 = 14$	MA1
	$10 < A \leq 18$	A1
<b>24</b>	$374.82 = 120\%$	MA1
	$\frac{374.82}{120} \times 20 = 62.47$	MA1A1
<b>25</b>	<b>(a)</b> 36, 78, 106, 115	A1
	<b>(b)</b> 6 correct points plotted	A2 ( 4 correct A1)
	lines/curve	A1
	<b>(c)</b> correct reading	A1
	<b>(d)</b> 20% of 115 = 23	MA1
	reading at 92	MA1
	correct reading	A1
<b>26</b>	$y = -2x + 4$ so $m = -2$	MA1
	$y = -2x + c$ so $-3 = -2(2) + c$ so $c = 1$	MA1
	$y = -2x + 1$	A1
<b>27</b>	$\frac{18}{x(x+3)} \times \frac{(x+2)(x+3)}{6}$	MA1MA1
	$\frac{3(x+2)}{x}$	MA1

<b>28</b>	$\frac{\Theta}{360} \times \pi(8)^2 (= 0.5585\Theta)$	M1
	$6.4 = \frac{214.464}{0.5585} \Theta$	M1
	$3.5744 \Theta = 214.464$	MA1
	$\Theta = 60$	A1

**29** Let there be  $x$  boys

Then

$\frac{3}{5}x + \frac{9}{10}(30 - x) = 24$	MA1
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$6x + 9(30 - x) = 240$	MA1
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$6x + 270 - 9x = 240$ or $-3x = -30$	MA1
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10 boys, 20 girls	A1
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