

GCSE MATHEMATICS

MARK SCHEME

Practice Paper Foundation 1

Maximum marks: 80

Non-Calculator

View detailed guidance on the conclusions you can draw from your students' performance in these papers on the MERiT welcome page. Understand how your students compare with others and target revision effectively by entering marks into MERiT.

1	(a) radius	B1	
	(b) tangent	B1	
			[2]
2	75	B1	
			[1]
3	24 cm	B1	
			[1]
4	acute-angled and isosceles	B1	
			[1]
5	20	B1	
	3.7	B1ft	
	<i>ft 23.7 – their 20</i>		
	<i>SC1 169.6</i>		
			[2]
6	3×4 and 5×-2 or 12 and -10	M1	
	<i>oe</i>		
	2	A1	
			[2]
7	(a) 14	B1	
	(b) 3 (+) 1 (+) 5 (+) 2 (+) 8 (+) 1	M1	
	<i>Allow one error or omission</i>		
	<i>Accept clear indication on the diagram</i>		
	20	A1	
			[3]
8	(a) 28 : 12 or 14 : 6		
	Or $56 \div 8$ and $24 \div 8$ (may be done in stages)		
	Or 3 and 7 seen	M1	
	7 : 3	A1	
	(b) 1.25 : 1	B1	
	<i>oe e.g. $\frac{5}{4} : 1$</i>		

- (c) $180 \div (1 + 9)$ or 18 or 162 **M1**
 18 and 162 **A1**

Additional Guidance

- 162 and 18 **M1A0**

Build-up method will score 2 or 0
 e.g. 1 : 9

2 : 18 does not score **M1** for 18

[5]

- 9** Isosceles triangle with base on 9 cm line and vertex within 2 mm
 (ie in the circle on the overlay) **B2**

*B1 for any isosceles triangle on the base with vertex within 2 mm of centre line
 or B1 for any side 7.5 cm long ± 2 mm
 or any arc 7.5 cm drawn ± 2 mm
 or 7.5 (cm) seen*

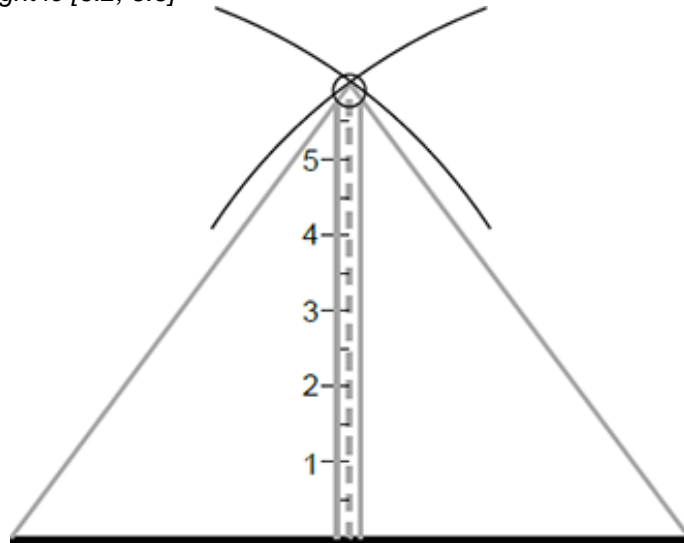
No **and** 1.2 (m) or 120 (cm)

ft the vertical height of their triangle

- or No **and** 6 (cm) **and** 6.4 (cm) **B1ft**

Jack's height accurately drawn ± 2 mm on diagram and a decision stated

Or Vertical height of their triangle may be stated and compared to Jack's scale height ie [6.2, 6.6]



[3]

10	Alternative method 1	M1
	Three whole numbers that each are less than 80 and have units digit 4	
Or	States that each number must have units digit 4	
	82	A1
	Alternative method 2	
	Correctly evaluated trial for three whole numbers, none of which are a multiple of 10, and that, when rounded, total 70	M1
	<i>eg</i> $33 + 33 + 13 = 79$	
	82	A1
	Additional Guidance	
	$39 + 33 + 13 = 85$ $(40 + 30 + 10 = 80)$	M0
	Beware 82 from incorrect values, e.g. $39 + 24 + 19 = 82$	M0A0
	<i>Ignore incorrectly evaluated trials that do not solely lead to the answer</i>	
		[2]
11	(a) $8n - 3$	B1
	(b) Alternative method 1	
	$x + 6$ oe	B1
	$4x + 9$ oe	B1
	their $(x + 6) + 2x + 7 +$ their $(4x + 9) = 57$	
	or $7x + 22 = 57$	M1
	oe	
	5	A1
	SC2 for 11, 17, 29	
	Alternative method 2	
	$x + 6$ oe	B1
	$4x + 9$ oe	B1
	their $(x + 6) = 11$	
	or $2x + 7 = 17$	M1
	or their $(4x + 9) = 29$	
	oe	
	5	A1
	SC2 for 11, 17, 29	
	Additional Guidance	
	$(2x + 7 + 5) \div 2$ or $(2x + 12) \div 2$ are oe for $x + 6$	B1
	$2(2x + 7) - 5$ or $4x + 14 - 5$ are oe for $4x + 9$	B1

[5]

12	2 or two	B1	
	Additional Guidance Allow words which imply two times e.g. double, twice		[1]
13	70 × 40 or 2800 <i>(Nisha)</i>	M1	
	their 2800 – $\frac{5}{100} \times$ their 2800 or 2800 – 140 or 2660 oe <i>(Nisha)</i>	M1dep	
	70 ÷ 5 or $\frac{1}{5} \times$ 70 or 14 or $\frac{4}{5} \times$ 70 or 56 oe <i>(Dipen)</i>	M1	
	their 14 × 4 × 40 or 56 × 40 or 70 × 40 – their 14 × 40 or their 2800 – their 14 × 40 or 2240 oe <i>dependent on 3rd method mark (Dipen)</i>	M1dep	
	2660 and 2240	A1	
	420 and No	A1ft	
	Additional Guidance 2800 – 140 implies minimum first and second Method marks 2800 – 560 implies minimum third and fourth Method marks		[6]
14	Alternative method 1 1 hour 30 (minutes) (× 4) oe 6 (hours) oe No and 5 <i>Correct decision for their values, M1 awarded</i>	M1 A1 A1ft	
	Alternative method 2 5 (hours) (÷ 4) oe 1 hour 15 (minutes) or 75 (minutes) or 1.25 (hours) or $1\frac{1}{4}$ (hours) oe No and 1 hour 30 (minutes) or 90 (minutes) or 1.5 (hours) or $1\frac{1}{2}$ (hours) <i>Correct decision for their times, M1 awarded. Must compare like for like eg 75 minutes with 90 minutes for 3 marks</i>	M1 A1 A1ft	

Alternative method 3

20 (squares) ($\div 4$) 6 (squares) ($\times 4$) **M1**

5 (squares) 24 (squares) **A1**

No and 6 No and 20 Strand (iii) **A1ft**

Correct decision for their values, M1 awarded.

Alternative method 4

$\frac{1.5}{5}$ (hours) or $\frac{90}{300}$ (mins) or $\frac{6}{20}$ (sq) oe **M1**

$\frac{6}{20}$ or $\frac{90}{300}$ Or fraction with a denominator that is a multiple of 20 **A1**

No and $\frac{5}{20}$ or both fractions with same denominator **A1ft**

Strand (iii)

oe Correct decision for their fractions, M1 awarded

Alternative method 5

$\frac{1.5}{5}$ (hours) or $\frac{90}{300}$ (mins) or $\frac{6}{20}$ (sq) **M1**

30% or 0.3 **A1**

No and 25% or Strand (iii)

oe Correct decision for their percentages, M1 awarded.

Must compare like with like.

No and 0.25 **A1ft**

[3]

15 -4, -3, -2, -1, 0, 1 **B2**

One error or omission also $-4 \leq n < 2$ B1

[2]

16 $\begin{pmatrix} 2 \\ -3 \end{pmatrix}$ **B1**

[1]

17 Line drawn across grid through (0, 8) and (5, -2) **B3**

B2 part of correct line drawn

B2 plotting at least 3 correct points (ignore incorrect points)

B1 plotting 2 correct points (ignore incorrect points)

B1 line of gradient -2

B1 line through (0, 8) or (4, 0)

SC1 line $y = -1/2x + 4$ from (0, 4) to (5, 1.5)

[3]

18	<p>$ADC = 110$</p> <p>Or $BAD = 180 - 110$ or $BAD = 70$</p> <p>Or $BCD = 180 - 110$ or $BCD = 70$</p> <p>Or any indication that angle $EAD =$ angle EDA</p> <p>Or any indication that angle $BCD =$ angle ADE</p> <p style="padding-left: 40px;"><i>may be seen on diagram</i></p> <p style="padding-left: 40px;"><i>eg both written as x or both having the same value</i></p>	M1	
	<p>$EDA = 180 - 110$ or $EDA = 70$</p> <p>Or $EAD = 180 - 110$ or $EAD = 70$</p> <p style="padding-left: 40px;"><i>may be seen on diagram</i></p>	M1dep	
	40	A1	[3]
19	<p>(a) Graph of $y = x^3$</p> <p style="padding-left: 40px;"><i>Must be in 1st and 3rd quadrants.</i></p> <p>(b) Graph of $y = x^2 + 3$</p> <p style="padding-left: 40px;"><i>3 need not be marked as long as graph is roughly symmetrical and crosses y-axis above origin</i></p>	B1	
		B1	[2]
20	<p>(a) $\frac{29}{50}$ oe</p> <p>(b) $\frac{23}{50}$ oe</p> <p style="padding-left: 40px;"><i>SC1 Incorrect but consistent denominator, greater than 29, used in (a) and (b) with correct numerators</i></p> <p>(c) Only has a skateboard</p> <p style="padding-left: 40px;"><i>oe</i></p>	B1	
		B1	
		B1	[3]
21	Alternative method 1		
	Plots $(-1, 2)$ and $(1, 6)$ <i>Mark intention</i>	M1	
	Fully correct ruled line through the correct points	A1	
	Draws the line $y = x$	B1	
	$(-4, -4)$ <i>ft their intersection</i>	B1ft	
	Additional Guidance		
	Correct line drawn implies points $(-1, 2)$ and $(1, 6)$ are plotted	M1A1	
	Alternative method 2		
	Gradient = $\frac{6-2}{1-(-1)}$ or $\frac{2-6}{-1--1}$ or 2	M1	
	<i>oe</i>		
	<i>Implied by the correct equation</i>		
	$(y =) 2x + 4$ <i>Correct function for their gradient</i>	M1dep	
	their $2x + 4 = x$ <i>ft their function</i>	M1	
	$(-4, -4)$	A1	

Additional Guidance

$$\frac{6-2}{1-(-1)} = -2$$

M1

$$y = -2x + 4$$

M1

$$-2x + 4 = x$$

M1

$$x = \frac{4}{3}$$

A0

[4]

22 Median ticked

B2

and

a valid reason for not using mode (eg there is no mode)

and

a valid reason for not using mean (eg 82 will affect the mean disproportionately)

B1 median ticked

Or valid reason to reject mean or valid reason to reject mode with any box or no box ticked

Additional Guidance

Accept any indication in place of a tick

B2

Ignore non-contradictory statements alongside a correct reason

Median ticked with reasons "There is no mode" and "82 would skew the mean"

No box or mode ticked with reason "Not mean, because of the 82"

B1

No box or mean ticked with reason "Not mode, all the numbers are different"

B1

No box or mode ticked with statement that 82 is very large

B0

Condone "one number" or "82" in reason for mean if intention is clear, e.g. "One of the numbers is far bigger than the others"

Do not accept reasons for the mean indicating that 12.7 is too high unless 82 is also mentioned

Do not accept reasons given with the wrong measure
eg "It cannot be the mean as they're all different"

Do not accept a reason which simply defines mean and mode

Giving reasons for mode and mean does not imply a selection of median – the box must be ticked to achieve both marks

Median ticked with two valid reasons which are not attributed to median and mode
eg median ticked and "There is not a repeated number" and "82 is far too high to calculate the average"

Otherwise, reasons must be attributed

[2]

- 23 (a) $\frac{2}{5}$ B1
- (b) $\frac{5}{9} \times 72$ or 8×5 or $360 \div 9$ M1
- oe e.g. multiples of 8 listed and 5th one chosen with maximum one error*
- 40 A1
- SC1 32

Additional Guidance

- $\frac{40}{72}$ M1A0
- 40 out of 72 M1A1

[3]

24 Alternative method 1

- $\frac{17}{2}$ or $\frac{8}{3}$ M1
- oe fractions*

- their $\frac{17}{2} \times$ their $\frac{3}{8}$ M1
- conversion of both mixed numbers to improper fractions and multiplication of the conversion of $8\frac{1}{2}$ by the reciprocal of the conversion of $2\frac{2}{3}$*

- $\frac{51}{16}$ A1
- oe fraction or decimal*

- $3\frac{3}{16}$ B1ft
- oe mixed number*
ft correct conversion of their improper fraction to a mixed number

Alternative method 2

- $\frac{17}{2}$ or $\frac{8}{3}$ M1
- oe fractions*

- $\frac{51}{6} \div \frac{16}{6}$ M1
- conversion of both mixed numbers to improper fractions, correct conversion to improper fractions with a common denominator and division of the conversion of $8\frac{1}{2}$ by the conversion of $2\frac{2}{3}$*

- $\frac{51}{16}$ A1
- oe fraction or decimal*

- $3\frac{3}{16}$ B1ft
- oe mixed number*
ft correct conversion of their improper fraction to a mixed number

Additional Guidance

Working with decimals

0, 3 or 4

Ignore incorrect attempt to simplify a mixed number

eg $3\frac{3}{16} = 3\frac{1}{8}$

M1M1A1B1

$3\frac{3}{16}$ seen, then $\frac{51}{16}$ on answer line

M1M1A1B0

$\frac{9}{2}$ and $\frac{8}{3}$, $\frac{27}{6} \div \frac{16}{6}$, $\frac{27}{16}$, $1\frac{11}{16}$

M1M1A0B1ft

$\frac{9}{2}$ and $\frac{8}{3}$, $\frac{27}{6} \div \frac{16}{6}$, $1\frac{11}{16}$

M1M1A0B1ft

$\frac{9}{2}$ and $\frac{4}{3}$, $\frac{27}{6} \div \frac{8}{6}$, $\frac{27}{8}$, $3\frac{3}{8}$

M0M1A0B1ft

[4]

25 (a) $3x + 6$ **M1**

$5x + 3 =$ their $3x + 6$

$2x =$ their 3 **M1**

for collecting terms together

1.5 oe **A1 ft**

ft their second M1

(b) $2x + 32$ or $4x - 20$ **M1**

Accept $ax + ab$ for M1

$6x + 12$ or $6(x + 2)$ **A1**

$a = 6$ and $b = 2$ **A1 ft**

ft from their $6x + 12$ if M1 earned

SC2 $a = 6$ and $b = 12$

SC1 $a = 6$

[6]

26 (a) a^{25} **B1**

(b) a^{15} **B1**

(c) a^{100} **B1**

[3]

27 $\pi \times 8^2 (\div 2)$ oe **M1**

32π **A1**

[2]

28	(a) $1(.0) \times 10^{-6}$	B1
	(b) 50 000 000 000 000	B1
	(c) $4^3 = 2^6$ $2^{10} = 4^5$	M1
	their $2^6 \times 2 \times 2 \times 2 \times 2$	M1
	$4^5 \div 4 \div 4$	
	<i>For this mark the correct number of 2s or 4s needed for their 2^6 or their 4^5</i>	
	5 <i>SC1 answer only</i>	A1
	Alternative method 1	
	64 and 128	M1
	<i>Allow one arithmetical slip when multiplying by 2.</i>	
	64, 128, 256, 512 and 1024	M1 dep
	<i>Allow one arithmetical slip when multiplying by 2.</i>	
	5	A1
	<i>If one arithmetical slip then A0</i>	
	<i>SC1 answer only</i>	
	Alternative method 2	
	64 and 1024	M1
	$1024 \div 64 = 16$ oe	M1
	5 <i>SC1 answer only</i>	A1

[5]