

Mark schemes assessed questions Q9, Q10, Q18, and Q21 no answers provided.

Q1. (a) 9.7×10^{-4}

B1

(b) 300 000 and 4000

or

$$(10^5 \div 10^3 =) 10^2$$

$$\text{or } (10^5 \div 10^3 =) 100$$

$$\text{or } 7.5 \times 10^{(1)} \text{ or } 75 \times 10^0$$

or

$$\frac{3 \times 10^2}{4} \text{ or } \frac{300}{4}$$

M1

75

A1

[3]

Q2.

One correct conversion to a comparable form

$$0.08 \times 10^{-2} \text{ or } 0.0008$$

$$400 \times 10^{-4} \text{ or } 0.04$$

$$0.06 \times 10^{-2} \text{ or } 0.0006$$

$$7 \times 10^{-2} \text{ or } 700 \times 10^{-4}$$

M1

$$6 \times 10^{-4}$$

oe

$$8 \times 10^{-4}$$

accept in converted form

$$4 \times 10^{-2}$$

$$0.07$$

with no clearly incorrect working

A1

[2]

Q3.

- (a) 8.35 and 8.45 in the correct order

*B1 8.35 on the left or 8.45 on the right
or 8.45 and 8.35 in the wrong order
accept $8.44\dot{9}$ for 8.45*

B2

- (b) 41.75 and 42.25

*correct or ft their two different values from (a)
their 8.35 must be in the range (8.3, 8.4]
their 8.45 must be in the range (8.4, 8.5]
correct order or ft order
accept $42.24\dot{9}$ for 42.25*

B1ft

[3]

Q4.

$11.5 \text{ m} \leq \text{height} < 12.5 \text{ m}$

B1

[1]

Q5.

$2\frac{7}{9}$

B1

[1]

Q6.

81

M1dep

A1

Additional Guidance

3^4 and 81 on the answer line in either order

M1M1A1

81 in working and 3^4 on the answer line

M1M1A0

[3]

Q7.(a) $2a^2 + 15a - 1$

B2

$2a^2 + 15a$

or $2a^2 - 1$

or $15a - 1$

B1

$2a^2$ or $15a$ or -1

B3

(b) $4y(6y - 5)$ or $-4y(5 - 6y)$

B1

$2y(12y - 10)$ or $-2y(10 - 12y)$

or $y(24y - 20)$ or $-y(20 - 24y)$

or $4(6y^2 - 5y)$ or $-4(5y - 6y^2)$

or $2(12y^2 - 10y)$ or $-2(10y - 12y^2)$

B2

[5]

Q8.

$y + y$

B1

[1]

Q9. ASSESSED

Q10. ASSESSED

Q11.

$x = \frac{y+2}{3}$

B1

[1]

Q12.

(a) 22.6 or $\frac{113}{5}$ or $22\frac{3}{5}$

B1

(b) **Alternative method 1**

n^2 will be positive

and

$\frac{12}{n}$

will be negative

and

positive – negative = positive

oe

B1

n^2 will be positive

or

$\frac{12}{n}$

will be negative

B2

Alternative method 2

n^2 will be positive

and

$\frac{12}{-n}$

will be positive

and

positive + positive = positive

oe

B1

n^2 will be positive

or

$\frac{12}{-n}$

will be positive

[3]

Q13.

(x =) 14 and -14

B1

(x =) 14

or (x =) -14

B2

[2]

Q14. Correct factorisation of numerator

$4x(1 - 2x)$

correct factorisation of denominator

$6(2x - 1)$

or

correct cancelling by 2 throughout

$$\frac{2x - 4x^2}{6x - 3}$$

M1

Correct fraction with numerator

$4x(1 - 2x)$ or $-4x(2x - 1)$

and denominator

$6(2x - 1)$ or $-6(1 - 2x)$

oe with cancelling of 2 throughout

e.g.

$$\frac{2x(1-2x)}{3(2x-1)} \text{ or } \frac{2x(1-2x)}{-3(1-2x)}$$

or

$$-\frac{4x}{6} \text{ or } \frac{-4x}{6} \text{ or } \frac{4x}{-6}$$

or

$$\frac{2x(2-4x)}{-3(2-4x)} \text{ or } \frac{2x(2-4x)}{3(4x-2)}$$

$$-\frac{2x}{3} \text{ or } -\frac{2}{3}x \quad \text{allow} \quad \frac{-2x}{3} \text{ or } \frac{2x}{-3}$$

A1

[3]

Q15. Alternative method 1

$$2x + x = 18 + 6$$

oe

Eliminates a variable

Implied by $3x = n$, where $n > 18$

M1

$$3x = 24 \text{ or } x = 8$$

oe

A1

$$x = 8 \text{ and } y = 2$$

A1

Alternative method 2

$$y - -2y = 18 - 2 \times 6 \text{ or } y - -2y = 18 - 12$$

$$\text{or } y + 2y = 18 - 2 \times 6 \text{ or } y + 2y = 18 - 12$$

oe

Eliminates a variable

Implied by $2x - 2y = 12$ followed by $3y = m$, where $m < 18$

M1

$$3y = 6 \text{ or } -3y = -6 \text{ or } y = 2 \text{ or } -y = -2$$

oe

A1

$$x = 8 \text{ and } y = 2$$

A1

Alternative method 3

$$\frac{18 - y}{2} = y + 6$$

$$\text{or } 18 - 2x = x - 6$$

oe

Eliminates a variable

M1

$$3x = 24 \text{ or } x = 8 \text{ or } 3y = 6 \text{ or } y = 2$$

oe

Collects terms

A1

$$x = 8 \text{ and } y = 2$$

A1

[3]

Q16. $0.25\pi^2(30 - 20)^2(30 + 20)$

or $0.25\pi^2 \times 10^2 \times 50$

oe

allow use of π as [3.14, 3.142]

M1

[12 320, 12 340.21]

may be implied

A1

12 300 or 1.23×10^4

with no value outside

[12 320, 12 340.21] seen

A1

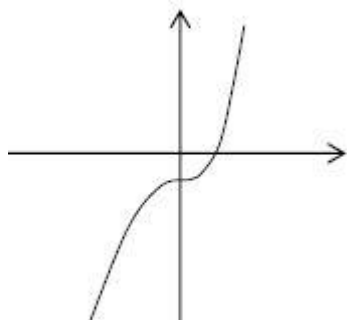
[3]

Q17. Fully correct curve

and

point (0, -2) indicated

B2



B1

[2]

Q18. ASSESSED

Q19.

One of

(102 →) 100

(8.14 →) 8

M1

their 100 = 0.5 × x^2 × their 8

or

($x^2 =$) their 100 ÷ 8 × 2

or

($x^2 =$) 100 ÷ their 8 × 2

or

25

or

their 8 × 5 × 5 × 0.5 = 100

or

8 × 5 × 5 × 0.5 = their 100

oe

must have used at least one correct 1 sf value

M1dep

5 with M2 seen

A1

[3]

Q20.

8² and 3² seen or 8 × 8 and 3 × 3 seen or 64 and 9 seen or 55

M1

$\sqrt{8^2 - 3^2}$ or $\sqrt{64 - 9}$ or $\sqrt{55}$

M1dep

M2 for $\sin^{-1}\left(\frac{3}{8}\right) = 22.(...)$ **and** 8 cos (their 22.(...))

or $\cos^{-1}\left(\frac{3}{8}\right) = 67.(...)$ or 68 **and** 8 sin (their 67.(...))

[7.4, 7.42]

A1

[3]

Q21. ASSESSED

Q22. Alternative method 1

$$\sin x = \frac{13}{16} \text{ or } \sin^{-1} \frac{13}{16}$$

$$\text{oe } \sin x = 0.8125$$

54(.3...)

A1

Alternative method 2

$$\cos x = \frac{13}{16} \text{ or } \cos^{-1} \frac{13}{16}$$

and

90 – their [35.6, 36]

Oe

M1

54(.3...)

A1

Alternative method 3

$$\cos x = \frac{\sqrt{16^2 - 13^2}}{16}$$

or

$$\tan x = \frac{13}{\sqrt{16^2 - 13^2}}$$

M1

oe

54(.3...)

A1

[2]

Q23.

$$\frac{1}{2} \times 14 \times AC = 80.5$$

oe e.g. $7AC = 80.5$
any letter for AC

M1

$$\frac{80.5 \times 2}{14} \text{ or } \frac{161}{14} \text{ or } 11.5$$

oe e.g. $\frac{80.5}{7}$
implies M2
may be seen on diagram

M1dep

$$\frac{1}{2} \times 19 \times \text{their } 11.5 \times \sin 36$$

or 64.21... or 64.22 or 64

oe
64.21... or 64.22 or 64 scores M3 if no
incorrect formula used

M1

64.2 with no incorrect formula used

A1

[4]