

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

**Q1.** (a)  $9.7 \times 10^{-4}$

**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*

$8.44\dot{9}$

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*

$42.24\dot{9}$

B1ft

[3]

**Q4.**

11.5 m ≤ height < 12.5 m

B1

[1]

**Q5.**

$2\frac{7}{9}$

B1

[1]

**Q6.**

81

M1dep

A1

**Additional Guidance**

3<sup>4</sup> and 81 on the answer line in either order

M1M1A1

81 in working and 3<sup>4</sup> 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.**

$$22.6 \text{ or } \frac{113}{5} \text{ or } 22\frac{3}{5}$$

**B1**

(b) **Alternative method 1**

$n^2$  will be positive

and

$$\frac{12}{n}$$

and

positive – negative = positive

*oe*

*B1*

*$n^2$  will be positive*

*or*

$$\frac{12}{n}$$

**B2**

**Alternative method 2**

$n^2$  will be positive

and

$$\frac{12}{n}$$

and

positive + positive = positive

*oe*

*B1*

*$n^2$  will be positive*

*or*

$$\frac{12}{n}$$

**[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

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

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

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

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

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  $\pi$  as [3.14, 3.142]

M1

[12 320, 12 340.21]

may be implied

A1

12 300 or  $1.23 \times 10^4$

with no value outside

[12 320, 12 340.21] seen

A1

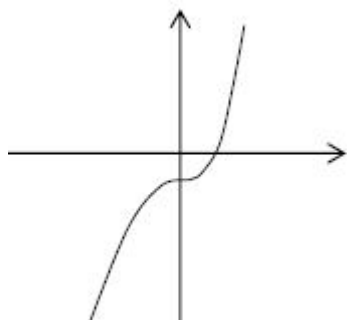
[3]

**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.**8<sup>2</sup> and 3<sup>2</sup> 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

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

oe

54(.3...)

A1

[2]

**Q23.**

$$\frac{1}{2}$$

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

**M1**

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

$$\frac{80.5}{7}$$

*implies M2  
may be seen on diagram*

**M1dep**

$$\frac{1}{2}$$

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]**