

1. a) ATTEMPTS TO REARRANGE EQUATION M1

$$\frac{3}{2} \quad A1$$

b) $-\frac{2}{3}$ SEEN OR THERE $-\frac{1}{\frac{3}{2}}$ B1

$$y-6 = -\frac{2}{3}(x-2) \quad M1 \text{ CORRECT STRUCTURE}$$

$$\text{f.g } 3y+2x=22 \quad A1 \text{ ALL CORRECT}$$

c) D(11,0) SEEN OR INPUTO B1

B(0,3) SEEN OR INPUTO B1

ATTEMPT TO FIND $|AB|$ OR $|AD|$ M1

$$\sqrt{13} \text{ OR } \sqrt{117} \text{ OR } 3\sqrt{13} \quad A1$$

FINAL ANSWER 39 c.a.o. A1

2. $34 = (k \times 4 - 3) \times \sqrt{4}$ M1

$$k=5 \quad A1$$

$$\int (5x-3)\sqrt{x} \, dx \quad B1$$

$$5x^{\frac{3}{2}} - 3x^{\frac{1}{2}} \quad M1$$

$$(y =) 2x^{\frac{5}{2}} - 2x^{\frac{3}{2}} + C \quad M42 \quad -1 \text{ eeo}$$

SUBS $x=4$ $y=4$ INTO) M1
THEIR EQUATION

$$C = -8 \text{ OR } y = 2x^{\frac{5}{2}} - 2x^{\frac{3}{2}} - 8 \quad A1$$

3. a) i) $4\sqrt{3} - 6 + 6 - 3\sqrt{3}$ AT LEAST 3 CORRECT M
 $\sqrt{3}$ c.a.o A

ii) MULTIPLY TOP BOTTOM BY $\sqrt{6} - \sqrt{2}$ B

$$\frac{6 - \sqrt{12} + 3\sqrt{12} - 6}{6 - \sqrt{12} + \sqrt{12} - 2}$$
 AT LEAST 7 THINGS CORRECT M
 $\sqrt{3}$ c.a.o A

b) SENSIBLE ATTEMPT f.g. $8w^{\frac{1}{2}} = \frac{1}{w}$ $\xrightarrow{\text{O2}}$ $w^{-1}(8w^{\frac{3}{2}} - 1) = 0$ M
 $8w^{\frac{3}{2}}w = 1$

$w^{\frac{3}{2}} = \frac{1}{8}$ A

$(\frac{1}{8})^{\frac{2}{3}}$ B

$w = \frac{1}{4}$ A c.a.o

4. a) $a=5, b=-3, c=5$ B

b) (MINIMUM VALUE IS) 5 DO NOT ACCEPT COORDINATES f.g. (3,5) A

c) $\sqrt{(x-5)^2 + (2x+1-6)^2}$ WITH OR WITHOUT $\sqrt{}$ M

$x^2 - 10x + 25$ OR $4x^2 - 20x + 25$ M

CONVINCINGLY ARRIVES AT THE ANSWER (3,4) A

d) $\sqrt{5}$ c.a.o A

e) $(3,7)$ B B

5. a) $y_3 = 7$
 $y_4 = 17$
 $y_5 = 31$
 $y_6 = 65$

MA3 -1 e200

b) $2^n \pm$ SOMETHING ELSE M1
 $2^n + (-1)^n$ A1

6. a) STRETCH, HORIZONTALLY, SCALE FACTOR OF 2
 (SIGN OF $f(\frac{1}{2}x)$ SCORES 2 MARKS)

M1 A1 A1
 dep on stretch

b) $f(x-1) + 15$ B1
 $\sqrt{8x^3 \cdot 15} + 15$ M1
 22 c.a.o A1

7. $(-4a)^2 - 4 \times 1 \times (2b+1) < 0$ M1 FORMING "DISCRIMINANT"
 M1 < 0

SIMPLIFIES TO $2b+1 > 4a^2$ o.e M1

CONVINCINGLY REACHES THE ANSWER A1
 GIVEN $b > \frac{1}{2}(2a+1)(2a-1)$ WITHOUT
 MISSING STEPS OR FUDGES

8.

$$\left(\frac{1}{3}x^3 - \frac{1}{6} + x^{-1}\right) \text{ o.e.} \quad \text{B2 -1 eeo}$$

$$\left(\frac{dy}{dx} =\right) x^2 - x^{-2} \quad \text{M1 \#}$$

IMPUGNS OR STATES THAT f_1 HAS GRAD $\frac{15}{4}$ B1

$$"x^2 - x^{-2}" = \frac{15}{4} \quad \text{B1}$$

$$4x^4 - 15x^2 - 4 = 0 \quad \text{M1}$$

$$(4x^2 + 1)(x^2 - 4) \quad \text{M1}$$

$$x^2 = 4 \quad (\text{MORE EXTRA}) \quad \text{A1}$$

$$x = \begin{matrix} 2 \\ -2 \end{matrix} \quad \text{BOTH} \quad \text{A1}$$

$$y = \begin{matrix} 3 \\ -\frac{10}{3} \end{matrix} \quad \text{EITHER} \quad \text{A1}$$

$$y - 3 = \frac{15}{4}(x - 2) \quad \text{o.e.} \quad 4y = 15x - 18 \quad \text{MA1}$$

$$y + \frac{10}{3} = \frac{15}{4}(x + 2) \quad \text{o.e.} \quad 12y = 45x + 50 \quad \text{MA1}$$

9.

$$\left. \begin{array}{l} 2b + 3c - 2 (= d) \\ (b - 3c + 1) - (2b + 3c) (= d) \\ (4b + 5c) - (b - 3c + 1) (= d) \end{array} \right\} \text{B2 ANY TWO}$$

REDUCES 3 EQUATIONS TO 2 EQUATIONS IN b & c (ATTEMPT) M1

$$\left. \begin{array}{l} b + 3c = 1 \\ 2b + 7c = 1 \end{array} \right\} \text{EITHER} \quad \text{MA1}$$

ATTEMPTS TO SOLVE "THEIR" TWO EQUATIONS IN b & c M1

$$b = 4 \quad c = -1 \quad \text{A2}$$

$$\frac{30}{2} [2 \times 2 + 29 \times 3]$$

M1 STRUCTURE, M2 $\rightarrow \begin{pmatrix} n = 30 \\ a = 2 \\ d = 3 \end{pmatrix}$ \rightarrow each error

CONVINCING (WORKINGS MUST BE SEEN) M1

1365 GIVEN A1