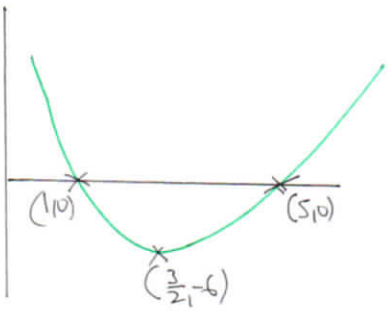
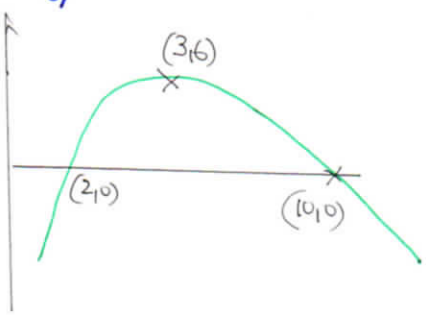
1. a)



B1 BOTH CORRECT x INTERCEPTS

B1 $(\frac{3}{2},-6)$

b)



B1 BOTH CORRECT x INTERCEPTS

B1 (3,6)

BOTH MARKS DEPENDENT ON THE CURVE HAVING THE CORRECT SHAPE AND IN THE CORRECT QUADRANT — IF INCORRECT SHAPE OR QUADRANT QUESTION SCORES B0 B0

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2. $9+6\sqrt{2}+2$ OR $11+6\sqrt{2}$ M1

ATTEMPT TO RATIONALISE AFTER EXPANSION & TIDY (ft)

OR

$$\frac{98(11-6\sqrt{2})}{(11+6\sqrt{2})(11-6\sqrt{2})}$$

} M1

"49" SEEN ON DENOMINATOR ft their rationalisation M1 dep

$22-12\sqrt{2}$ A1 c.a.o

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3 a) $\frac{9-3}{9-7}$ OR $\frac{3-9}{7-9}$ M1

3 A1 dep

$y=3x-18$ o.e A1

b) GRADIENT $-\frac{1}{3}$ "USED" B1

$x+3y=16$ o.e A1

3. (c) ATTEMPT TO SOLVE SIMULTANEOUS EQUATIONS

$y = \frac{x+9}{2}$ & "$x + 3y = 16$" M1 ft

SOLUTION WITH AT LEAST ONE SIGNIFICANT STEP M1 ft

C(1, 5) A2 c.a.o

(d) $\sqrt{(7-1)^2 + (3-5)^2}$ OR $\sqrt{(7-9)^2 + (3-9)^2}$ OR SIMILAR M1

$\sqrt{40}$ SEEN FOR 2 CALCULATIONS + CONCLUSION A1

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4. (a)(I) $\frac{1}{32}$ OR $\frac{1}{64}$ SEEN B1

$\frac{1}{64}$ SEEN FROM $\frac{1}{32} - \frac{1}{64}$ A1

(II) $\left(\sqrt{\frac{4}{9}}\right)^3$ OR $\left(\frac{2}{3}\right)^3$ B1

$\frac{8}{27}$ A1

(b) $\frac{1}{512}$ OR $\frac{1}{8^3}$ A1

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5. (a) $(x-2)(x+6)$ M1

$x = \begin{cases} 2 \\ -6 \end{cases}$ BOTH A1

(b) $(x^2-2)(x^2-6)$ OR EVIDENCE OF SUBSTITUTION

e.g. $a^2 + 4a - 12 = 0$ $a = x^2$ M1

$x^2 = \begin{cases} 2 \\ \cancel{-6} \end{cases}$ A1 (MUST "CROSS OUT" −6)

$x = \pm\sqrt{2}$ A1 (CONDONE NOT CROSSING OUT −6 IF THIS ANSWER IS SEEN)

6. $51+55+59+\ldots+131$ ← AWARD B1 IF NOTHING ELSE IS SCORED

$a=51$ $d=4$ or $l=131$ $n=21$ B3

$\frac{21}{2}[51+131]$ OR $\frac{21}{2}[2\times51+20\times4]$ o.e M1

21×91 OR 10.5×182 M1

FULL METHOD MUST BE SEEN BEFORE ARRIVING TO 1911 A1

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7. (a) $\int 6x^2-6x-20\,dx$ M1

$y=(2x^3-3x^2-20x+C)$ A1 MUST HAVE +C

$x=0$ $y=0$ $C=0$ M1

$(y=)\ 2x^3-3x^2-20x$ A1

$(y=)\ x(2x^2-3x-20)$ M1

$(y=)\ x(2x+5)(x-4)$ A1

(b) SHAPE ~ B1

THROUGH (0,0) B1

$(-\frac{5}{2},0)$ $(4,0)$ BOTH B1

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8. $2(2x^2-6x+7)+x=8$ M1

$4x^2-11x+6=0$ A1

$(4x-3)(x-2)=0$ M1

$x=$ 2, $\frac{3}{4}$ $y=$ 3, $\frac{29}{8}$ A3 -1eeoo

ALTERNATIVE

$y=2(8-2y)^2-6(8-2y)+7$ M1

$8y^2-52y+87$ A1

$(8y-29)(y-3)=0$ M1

$y=$ $\frac{29}{8}$, 3 $x=$ $\frac{3}{4}$, 2

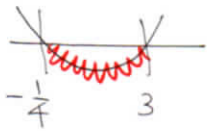
A3 -1eeoo

9. $b^2-4ac<0$ OR $[2(2p-1)]^2-4\times1\times(7p+4)<0$ OE ← CONDONE IF MISSING AT THIS STAGE M1

$4p^2-11p-3<0$ A2 -1 eeoo

$(4p+1)(p-3)<0$ M1

C.V OR $p=\begin{matrix}3\\-\frac{1}{4}\end{matrix}$ A1 BOTH



M1 (OR EQUIVALENT METHOD)

$-\frac{1}{4}<p<3$ A1 dep

C.a.o (no answers in x)

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10. a) $\frac{dy}{dx}=6x^2-18x+12$ B1 (MAY BE AWARDED IN PART b)

$0=6x^2-18+12$ (OR $x^2-3x+2=0$) M1

$0=(x-2)(x-1)$ M1

$x=\begin{matrix}1\\2\end{matrix}$ BOTH $y=\begin{matrix}-5\\-6\end{matrix}$

A1 A1

(b) $6(-1)^2-18(-1)+12$ OR $6+18+12$ M1

36 A1 c.a.o

(c) $6x^2-18x+18=36$ OR $x^2-3x-4=0$ M1

$(x-4)(x+1)=0$ A1

$x=\begin{matrix}4\\-1\end{matrix}$ A1

(4, 22) A1

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240000 SEEN B1

$360\,000 = \frac{40}{2}(2a + 39d)$ OR $240000 = \frac{30}{2}(2a + 29d)$ M3 dep on attaining in equation

$2a = 18000 - 39d$ OR $16000 = 2a + 29d$ A1

ATTEMPT TO ELIMINATE OR SUBSTITUTE. M1

$(a =)$ 5100 A1