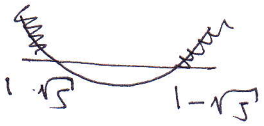
1.

COMPLETES THE SQUARE OR USE QUADRATIC FORMULA M1

SIGHT OF $x = 1 \pm \sqrt{5}$ O.E A1



OR EQUIVALENT METHOD M1

$x < 1-\sqrt{5}$ OR $x > 1+\sqrt{5}$ A1 dep

(DO NOT ACCEPT UNCONVENTIONAL NOTATION AT THE END)

2.

$1 + 2\sqrt{3} + 3$ OE B1 B1

$16 + 16\sqrt{3} + 12$ A2 −1 eeoo

GIVES THE FINAL ANSWER CONVINCINGLY A1

3.

$\int 5 - \frac{8}{x^2}\,dx$ O.E B1

$5x + 8x^{-1} + C$ OE A3

$2[5+8+c] = 4+[10+4+c]$ M1

$C = -8$ OR $5x + \frac{8}{x} - 8$ A1

FINAL ANSWER 14 C.a.o A1

4. a) $\frac{-3-y}{2-(-2)}$ O.E M1

$-\frac{y+3}{4}$ OR $\frac{-y-3}{4}$ OR $\frac{y+3}{-4}$ A1

b) $\frac{y-5}{-3}$ O.E B1

$-\frac{y+3}{4} \times \frac{y-5}{-3} = -1$ OR $-\frac{y+3}{4} = \frac{3}{y-5}$ OR $\frac{y-5}{-3} = \frac{4}{y+3}$ M1

$y^2 - 2y - 3 = 0$ M1

$(y+1)(y-3)$ M1

$y = -1, 3$ (BOTH) A1

---

6. a) $36000 = 18000 + (n-1) \times 1800$ M1

$N = 11$ A1

b) $\frac{"11"}{2}[18000 + 36000]$ OR $\frac{"11"}{2}[2 \times 18000 + 10 \times 1800]$ M1 ft

297000 A1

c) $36000 = A + 14 \times 1000$ M1

$A = 22000$ A1

$18000 + (n-1) \times 1800 = "22000" + (n-1) \times 1000$ M1 ft.

$n = 6$ A1

d) "297000" + 4×36000 M1 ft.

441000 A1

$\frac{15}{2}["22000" + 36000]$ M1 ft

435000 A1

6000 c.a.o A1

6. a) $1 + 2x^{\frac{1}{2}} + x$ B1

$\left(\frac{dy}{dx} =\right) x^{-\frac{1}{2}} + 1$ A1 A1

b) IMPLIES OR STATES GRADIENT OF LINE IS $\frac{3}{2}$ B1

" $x^{-\frac{1}{2}} + 1 = \frac{3}{2}$ " M1

SIGNIFICANT STEP IN THE SOLUTION OF EQUATION M1

$x = 4$ A1

$y = 9$ A1

---

7. a) $76 = a + 88b$ M1

$70 = a + 76b$ M1

ATTEMPTS A VALID SOLUTION METHOD M1

$a = 32$, $b = \frac{1}{2}$ A1 A1

b) $2 \times 88 - 64$ O.E OR $2 \times$ "112" $- 64$ M1
(AFTER THEIR FIRST STEP)

112 A1

FINAL ANSWER 160 A1

c) $L = 32 + \frac{1}{2}L$ M1

$L = 64$ c.a.o A1 dep

8. $y = mx$ o.e B1

$mx = \sqrt{2x-4}$ M1

$m^2x^2 = 2x - 4$ or $m^2x^2 - 2x + 4 = 0$ M1

$(-2)^2 - 4m^2 \times 4 = 0$ M1

$m = \frac{1}{2}$ (ignore $-\frac{1}{2}$) A1

$\frac{1}{2}x^2 - 2x + 4 = 0$ or $x^2 - 8x + 16 = 0$ M1

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

$x = 4$ A1

$y = 2$ A1

9. $2\sqrt{3}x^2 - 7x + 2\sqrt{3} = 0$ o.e M1

QUADRATIC FORMULA OR COMPLETING THE SQUARE

$$\frac{7 \pm \sqrt{49 - 4(2\sqrt{3})(2\sqrt{3})}}{2 \times 2\sqrt{3}}$$ M1

$\frac{7 \pm 1}{4\sqrt{3}}$ o.e MA1

RATIONALIZES ANSWERS M1

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

$\frac{1}{2}\sqrt{3}$ A1

10.

SIGHT OF $f(x-1)$ & $f(\frac{1}{2}x)$ TOGETHER

OR $f(x+1)$ & $f(2x)$ TOGETHER

OR $f(\frac{1}{2}x-1)$ — B1

EVIDENCE OF ATTEMPTING TO REVERSE IN THE CORRECT ORDER — M1

$8\left(\frac{1}{2}x\right)^2 - 22\left(\frac{1}{2}x\right) + 10$ M1

$2x^2 - 11x + 10$ A1

"$2(x+1)^2 - 11(x+1) + 10$" M1 ft

SIMPLIFIES CORRECTLY TO THE ANSWER GIVEN A1

ACCEPT $g\left(\frac{1}{2}x + \frac{1}{2}\right)$ B2

$8\left(\frac{1}{2}x+\frac{1}{2}\right)^2 - 22\left(\frac{1}{2}x+\frac{1}{2}\right) + 10$ M1

$8\left(\frac{1}{4}x^2 + \frac{1}{2}x + \frac{1}{4}\right) - 11x - 11 + 10$ M1

$2x^2 + 4x + 2 - 11x - 11 + 10$ M1

$2x^2 - 7x + 1$ A1