1. a) SIGHT OF $\frac{3^{\frac{1}{2}}}{3^2}$ M1

SIGHT OF $3^{-\frac{3}{2}}$ M1

$y = -\frac{3}{2}$ A1 dep on at least one of the previous M1

ALTERNATIVE

$3^{y+2}$ M1

$y+2 = \frac{1}{2}$ M1

$y = -\frac{3}{2}$ A1

b) $25 \times 21$ OR $5\sqrt{21}$ M1

$5\sqrt{7}\sqrt{3}$ A1

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2. a) $\frac{-11-k}{5} = -2$ o.e OR $y+11 = -2(x+2)$ M1

$k = -1$ A1

b) $a = 14$, $b = -1$ B1 B1

c) $\sqrt{(c-7)^2 + (-3-(-7))^2} = \sqrt{17}$ MAY NOT HAVE $\sqrt{}$ M1

$(c-7)^2 + 16 = 17$ o.e M1

OR $c^2 - 14c + 48 = 0$

$c - 7 = \pm 1$ A1

$(c-8)(c-6)$

$c = 8$ A1

$c = 6$ A1

3. a) EXPANDS TO $3x^2 - 10x + 3$ o.e B1

$\int "3x^2 - 10x + 3" \, dx$ B1

$(y =) x^3 - 5x^2 + 3x + C$ A3 ft −1 eeoo (from 3 term quadratic)

USES $(2,3)$ E.g. $3 = 2^3 - 5\times2^2 + 3\times2 + C$ M1

$C = 9$ OR $f(x) = x^3 - 5x^2 + 3x + 9$ A1

b) SIGHT OF $k = 1$ B1

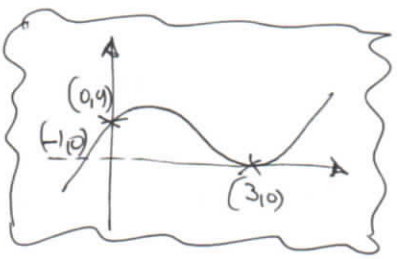
$(x+1)(x^2 - 6x + 9)$ SEEN B1

MULTIPLIES & CORRECTLY OBTAINS $x^3 - 5x^2 + 3x + 9$ MA1

c) CORRECT SHAPE B1 ← dep

TOUCHING AT $(3,0)$, CROSSING AT $(-1,0)$ M1

$(0,9)$ B1




4. a) 55 c.a.o A1

b) $7 \times 3 \times 5^2$ OR 82 SEEN M1

27 c.a.o A1

5. SIMPLIFIES TO $(2k-5)x^2 + (1-k)x + (k-2)$ o.e MA1

SIGHT OF $2k - 5 < 0$ B1

SIGHT OF $b^2 - 4ac < 0$ OR $(1-k)^2 - 4(2k-5)(k-2) < 0$ o.e M1

$\pm 7k^2 \mp 34k \pm 39$ M1

$(7k - 13)(k - 3)$ M1

$k = < \frac{3}{13/7}$ BOTH A1


OR SIMILAR M1 dep

$k < \frac{13}{7}$ OR $k > 3$ (BOTH) A1

FINAL ANSWER MUST BE $k < \frac{13}{7}$ c.a.o A1

DO NOT ACCEPT ≤
DO NOT ACCEPT $3 < k < \frac{13}{7}$
MUST USE k NO x
ALLOW USE OF (AND) INSTEAD OF (OR)

6. $3 = a \times 2 + b$ B1

$2 + 3 + [3a + b] = 12$ B1

SIGHT OF

$2a + b = 3$
$3a + b = 7$ } BOTH M A1

ATTEMPTS SENSIBLE SOLUTION M1

$a = 4$ , $b = 4$ A1 A1

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7. $\left(\frac{dy}{dx} =\right) 6x^2 - 10x$ B1

$6 \times 2^2 - 10 \times 2 = 4$
$6 \times 1^2 - 10 \times 1 = -4$
$2 \times 2^3 - 5 \times 2^2 + a = a - 4$
$2 \times 1^3 - 5 \times 1^2 + a = a - 3$ } M A 4

EITHER AS WORKINGS OR AS A SIMPLIFIED ANSWER

$y - "(a-4)" = "4"(x-2)$ M1

$y - "(a-3)" = "\frac{1}{4}"(x-1)$ M1

$4x + a = 12$
$x + 4a = 13$ } A1 EITHER

ATTEMPTS SOLUTION M1

$Q\left(\frac{7}{3}, 10\right)$ A1

$a = \frac{8}{3}$ A1

8. a) $10 + 11 \times 2$ M1

32 A1

b) $\frac{12}{2}[2 \times 10 + 11 \times 2]$ OR $\frac{12}{2}[10 + 32]$ OE M1

252 A1

FINAL ANSWER 377 A1

c) IMPLIES $a = 7$ B1

$d = 2$ B1

475 SEEN B1

$\frac{n}{2}[2 \times "7" + (n-1) \times "2"] = 475$ M1

$n(n+6) = 475$ OR $n^2 + 6n - 475$ M1

"TRIALS" OR $(n - 19)(n + 25)$ M1

$n = 19$ A1

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9. $y = A - Bx^2$ B1

$y = 6 - Bx^2$ B1

USES $(0, 6)$ INTO THEIR "$y = 6 - Bx^2$" M1

$y = 6 - \frac{3}{8}x^2$ OR $B = \frac{3}{8}$ A1

SUBS $x = 3$ INTO "$y = 6 - \frac{3}{8}x^2$" M1

OBTAINS $\frac{21}{8}$ A1

CONCLUDES CORRECTLY A1