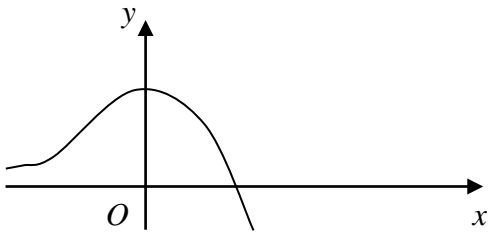
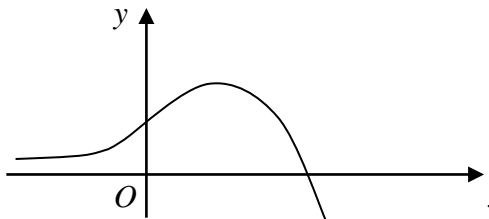


Question number	Scheme	Marks
1.	$a = 7, d = 2$ $S_{20} = \frac{1}{2} \times 20 \times (2 \times 7 + 19 \times 2) = 520$	B1 M1 A1 <b>(3 marks)</b>
2.	$\int (5x + 3\sqrt{x}) dx = \frac{5x^2}{2} + 2x^{\frac{3}{2}} + C$	M1 A1 A1 B1 <b>(4 marks)</b>
3. (a) (b)	$\sqrt{80} = 4\sqrt{5}$ $(4 - \sqrt{5})^2 = 16 - 8\sqrt{5} + 5 = 21 - 8\sqrt{5}$	B1 (1) M1 A1 A1 (3) <b>(4 marks)</b>
4.	Gradient of $AB = \frac{4 - (-6)}{3 - 7} \left( = -\frac{5}{2} \right)$ Gradient of $l = \frac{2}{5}$ $y - 4 = \frac{2}{5}(x - 3) \qquad 2x - 5y + 14 = 0$	M1 A1 M1 M1 A1 (5) <b>(5 marks)</b>
5. (a) (b)	<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  </div> <div style="text-align: center;"> <p>Position, Shape</p> <p>(0, 2), (2, 0)</p> </div> </div> <div style="display: flex; justify-content: space-around; margin-top: 20px;"> <div style="text-align: center;">  </div> <div style="text-align: center;"> <p>Position, Shape</p> <p>(0, 1), <math>\left(\frac{1}{2}, 2\right)</math>, <math>\left(\frac{3}{2}, 0\right)</math></p> </div> </div>	B1 B1 B1 (3) B1 B2 (1, 0) (3) <b>(6 marks)</b>



Question number	Scheme	Marks
<p><b>9.</b> (a)</p> <p>(b)</p> <p>(c)</p>	<p><math>f(x) = x^3 - 4x^2 + 6x + C</math></p> <p><math>5 = 27 - 36 + 18 + C \quad C = -4</math></p> <p><math>x = 2: \quad y = 8 - 16 + 12 - 4 = 0</math></p> <p><math>f'(3) = 27 - 24 + 6 = 9</math>, Parallel therefore equal gradient</p> <p><math>3x^2 - 8x + 6 = 9 \quad 3x^2 - 8x - 3 = 0</math></p> <p><math>(3x + 1)(x - 3) = 0 \quad Q: x = -\frac{1}{3}</math></p>	<p>M1 A1</p> <p>M1 A1 (4)</p> <p>M1 A1 (2)</p> <p>B1, M1</p> <p>M1</p> <p>M1 A1 (5)</p> <p><b>(11 marks)</b></p>
<p><b>10.</b> (a)</p> <p>(b)</p> <p>(c)</p>	<p><math>\frac{dy}{dx} = 3x^2 - 5 - 2x^{-2}</math></p> <p>At both A and B, <math>\frac{dy}{dx} = 3 \times 1 - 5 - \frac{2}{1} \quad (= -4)</math></p> <p>Gradient of normal <math>= \frac{1}{4}</math></p> <p><math>y - (-2) = \frac{1}{4}(x - 1) \quad 4y = x - 9</math></p> <p>Normal at A meets y-axis where <math>x = 0: \quad y = -\frac{9}{4}</math></p> <p>Similarly for normal at B: <math>4y = x + 9 \quad y = \frac{9}{4}</math></p> <p>Length of PQ <math>= \frac{9}{4} + \frac{9}{4} = \frac{9}{2}</math></p>	<p>M1 A2(1,0)</p> <p>M1 A1 (5)</p> <p>M1 A1ft</p> <p>M1 A1 (4)</p> <p>B1</p> <p>M1 A1</p> <p>A1 (4)</p> <p><b>(13 marks)</b></p>