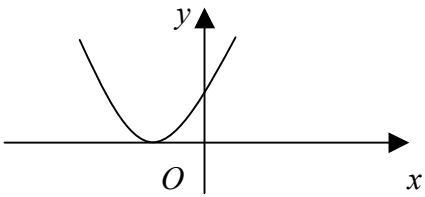


**EDEXCEL PURE MATHEMATICS C1 (6663) SPECIMEN PAPER MARK SCHEME**

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-between;"> <div style="width: 45%;"> </div> <div style="width: 45%;">                     Position, Shape                      (0, 2), (2, 0)                 </div> </div> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> </div> <div style="width: 45%;">                     Position, Shape                      (0, 1), <math>\left(\frac{1}{2}, 2\right)</math>, <math>\left(\frac{3}{2}, 0\right)</math> </div> </div>	B1 B1 B1 (3) B1 B2 (1, 0) (3) <b>(6 marks)</b>

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Question number	Scheme	Marks
<p><b>6.</b> (a)</p> <p>(b)</p>	$5 - 2x = 2x^2 - 3x - 16$ $(2x - 7)(x + 3) = 0$ <p>Using critical values <math>x = -3,</math></p> $x < -3,$ $2x^2 - x - 21 = 0$ $x = -3, x = \frac{7}{2}$ $y = 11, y = -2$ $x = \frac{7}{2}$ $x > \frac{7}{2}$	<p>M1 A1</p> <p>M1 A1</p> <p>M1 A1ft (6)</p> <p>M1</p> <p>M1 A1ft (3)</p> <p><b>(9 marks)</b></p>
<p><b>7.</b> (a)</p> <p>(b)</p> <p>(c)</p>	$a + (n - 1)d = 250 + (10 \times 50) = \text{£}750$ $\frac{1}{2}n [2a + (n - 1)d] = \frac{1}{2} \times 20 \times (500 + 19 \times 50), = \text{£}14500$ $B: \frac{1}{2} \times 20 \times (2A + 19 \times 60) [= 10(2A + 1140)], = \text{“}14500\text{”}$ <p>Solve for A: <math>A = 155</math></p>	<p>M1 A1 (2)</p> <p>M1 A1, A1 (3)</p> <p>B1, M1</p> <p>M1 A1 (4)</p> <p><b>(9 marks)</b></p>
<p><b>8.</b> (a)</p> <p>(b)</p> <p>(c)</p> <p>(d)</p>	$a = 5, \quad (x + 5)^2 - 25 + 36 \quad b = 11$ $b^2 - 4ac = 100 - 144, < 0, \text{ therefore no real roots}$ <p>Equal roots if <math>b^2 - 4ac = 0</math>      <math>4k = 100</math>      <math>k = 25</math></p>  <p>Shape, position</p> <p><math>(-5, 0) (0, 25)</math></p>	<p>B1, M1 A1 (3)</p> <p>M1 A1 (2)</p> <p>M1 A1 (2)</p> <p>B1 B1</p> <p>B1 B1ft (4)</p> <p><b>(11 marks)</b></p>

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