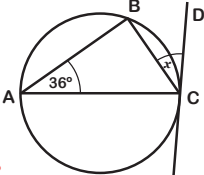
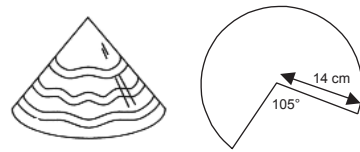
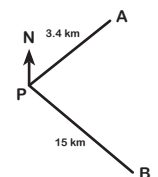


GCSE Higher Revision Mat (3) ANSWERS



<p>1) The diagram shows a circle. AC is a diameter of the circle and CD is a tangent. Work out the size of x.</p> <p>The angle in a semicircle is 90°, so angle $ABC = 90^\circ$.</p> <p>The angle sum of any triangle is 180°, so:</p> <p>Angle $ACB = 180 - 90 - 36 = 54^\circ$.</p> <p>The angle between a tangent and the radius at the point of contact is 90°, so $x = 90 - 54 = 36^\circ$</p> 	<p>2) Here are the first five terms of a sequence 14, 31, 58, 95, 142, ... Find the tenth term of the sequence.</p> <p style="text-align: center;">527</p>	<p>3) Tom has to cross two level crossings on his way to school. The probability he has to stop at the first level crossing is 0.7. The probability he has to stop at the second level crossing is 0.4. The two events are independent. What is the probability that Tom does not stop at both level crossings?</p> <p style="text-align: center;">$0.3 \times 0.6 = 0.18$</p>	<p>4) Simplify $(\sqrt{2} + \sqrt{3})^2$.</p> <p style="text-align: center;">$5 + 2\sqrt{6}$</p>
<p>5) Simplify fully:</p> $\frac{4x^3 - 25x}{3x^2 + 5x - 2} \div \frac{2x^3 - 11x^2 + 15x}{x^2 - x - 6}$ <p style="text-align: center;">$\frac{2x + 5}{3x - 1}$</p>	<p>6) Write $0.\dot{4}\dot{2}$ as a fraction in its simplest terms.</p> <p style="text-align: center;">$0.\dot{4}\dot{2} = \frac{42}{99} = \frac{14}{33}$</p>	<p>7) Expand and simplify: $(x - 5)^3$</p> <p style="text-align: center;">$x^3 - 15x^2 + 75x - 125$</p>	<p>8) A party hat is in the shape of a cone. The cone is made from a sector of a circle. Calculate the area of sector.</p>  <p style="text-align: center;">436 cm^2</p>
<p>9) Find the coordinates of the turning point of $y = 2x^2 + 12x + 7$.</p> <p style="text-align: center;">$(-3, -11)$</p>	<p>10) Use the iterative formula $x_{n+1} = \frac{3 - x_n^2}{5}$ and $x_0 = 0$ three times to find an estimate for the solution of $x^2 + 5x - 3 = 0$. Show your answers to 3 d.p.</p> <p style="text-align: center;">$x_1 = 0.6$ $x_2 = 0.528$ $x_3 = 0.544$</p>	<p>11) Simplify $\frac{\sqrt{8}}{\sqrt{2}}$</p> <p style="text-align: center;">$\frac{\sqrt{8}}{\sqrt{2}} = \sqrt{\frac{8}{2}} = \sqrt{4} = 2$</p>	<p>12) Solve the equation $2x^2 + 7x - 30 = 0$</p> <p style="text-align: center;">$x = 2.5$ and $x = -6$</p>
<p>13) Show that the line passing through $A(2, -4)$ and $B(5, 1)$ is perpendicular to $3x + 5y = 10$.</p> <p style="text-align: center;">$3x + 5y = 10 \Rightarrow y = -\frac{3}{5}x + 2$</p> <p>Gradient of AB: $\frac{1 - (-4)}{5 - 2} = \frac{5}{3}$</p> <p style="text-align: center;">$\frac{5}{3} \times -\frac{3}{5} = -1$</p> <p style="text-align: center;">Therefore the lines are perpendicular</p>	<p>14) Ship A is 3.4 km from port P on a bearing of 040°. Ship B is 15 km from P on a bearing of 155°. Calculate the distance between the two ships. Give your answer to an appropriate degree of accuracy.</p>  <p style="text-align: center;">$16.723... \approx 17 \text{ km}$</p>	<p>15) Factorise $7x^2 - 44x + 12$</p> <p style="text-align: center;">$(7x - 2)(x - 6)$</p>	<p>16) Given that $f(x) = x^2 + 2x - 7$, write an expression for $f(2a - 3)$.</p> <p style="text-align: center;">$f(2a - 3) = (2a - 3)^2 + 2(2a - 3) - 7$ $= 4a^2 - 12a + 9 + 4a - 6 - 7$ $= 4a^2 - 8a - 4$</p>