Circles – Area and Circumference Mark Scheme			

1		[5] Mark for each correctly matched term
2(a)	$2 \times 3.7 = 7.4$ m	[1] Diameter of the circle
2(b)	$C = \pi d$ or $7.4 \times \pi = 23.2478$	[1] Correct circumference
	$C = 23.25$ m	[1] Correct rounding required
3(a)	Diameter $= 2 \times r = 2 \times 3.6 = 7.2$ cm	[1] Multiplication of radius by 2
	Circumference $= \pi \times d = 2 \times \pi \times r = 7.2\pi$ cm	[1] Correct circumference in terms of π
3(b)	Area $= \pi \times r^2 = \pi \times 3.6^2$	[1] Correct calculation
	$= 12.96\,\pi = 40.7$ cm^2	[1] Correct area to 1 decimal place
4	Perimeter of semi-circle arc: $\frac{1}{2} \times \pi \times d = \frac{1}{2} \times \pi \times 16 = 8\pi$ cm	[1] Correct calculation
	Perimeter of diameter $= 16$ cm	[1] Correct calculation
	Total Perimeter $= 16 + 8\pi = 41.1$ cm	[1] Correct perimeter to 1 decimal place

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5	Area $= \pi \times x^2 = 150$ cm^2	[1] Forming correct equation
	$x = \sqrt{\dfrac{150}{\pi}}$	[1] Rearranging to make x the subject
	$x = 6.9$ cm	[1] Correct radius to 1 decimal place
6(a)	Area of $A = \pi \times 16^2 = 256\pi$ cm^2	[1] Correct area of circle A
6(b)	Area of $B = \pi \times 7^2 = 49\pi$ cm^2	[1] Correct area of circle B
	Shaded area $= 256\pi - 49\pi = 207\pi$ cm^2	[1] Finding the difference of the two areas
	$= 650.3$ cm^2	[1] Correct shaded area to 1 decimal place
7	Shaded outer area $= 100\pi - 49\pi = 51\pi$ m^2	[1] Calculation of the area of the outer ring
	Area of interior circles $= 5 \times (\pi \times 1^2) = 5\pi$ m^2	[1] Calculation of the interior circles area
	Total shaded area $= (51\pi + 5\pi) = 56\pi$ m^2	[1] Summing all shaded areas
	$= \dfrac{56\pi}{100\pi} = 56\%$	[1] Correct shaded area as a percentage to the total area of the large circle
8	Ratio of areas is $1^2 : 2^2 : 3^2 : 5^2$	[1] Correct calculation
	$1 : 4 : 9 : 25$	[1] Correct answer in its simplest form
9(a)	Diagonal $AC = 12$ cm	[1] Identify length of diagonal AC or BD
	$x^2 + x^2 = 12^2$ $2x^2 = 144$ $x = \sqrt{72} = 6\sqrt{2}$	[1] By use of Pythagoras or otherwise, find the lengths, x, of each side of the square
	Area $= 6\sqrt{2} \times 6\sqrt{2} = 72$ cm^2	[1] Correct area of square $ABCD$
9(b)	Area of circle $= \pi \times 6^2 = 36\pi$	[1] Correct calculation
	Shaded area $= 36\pi - 72 = 41.1$ cm^2	[1] Correct shaded area to 1 decimal place

END