Multiple choice questions - Equation of a circle and tangents

Year: Year 11 · 10

Question 1 (Higher) What is the equation of the circle with centre the origin and radius 4?

- ◯ **A.** $x^2 + y^2 = 4$
- ◯ **B.** $x^2 + y^2 = 8$
- ◯ **C.** $x^2 + y^2 = 16$
- ◯ **D.** $x + y = 16$

Question 2 (Higher) What is the radius of $x^2 + y^2 = 49$?

- ◯ **A.** 49
- ◯ **B.** 7
- ◯ **C.** 24.5
- ◯ **D.** $\sqrt{49}$ is not valid

Question 3 (Higher) Which point is on $x^2 + y^2 = 25$?

- ◯ **A.** $(2, 4)$
- ◯ **B.** $(3, 5)$
- ◯ **C.** $(4, 3)$
- ◯ **D.** $(5, 5)$

Question 4 (Higher) The point $(2, 3)$ and the circle $x^2 + y^2 = 16$. The point is

- ◯ **A.** on the circle
- ◯ **B.** inside
- ◯ **C.** outside
- ◯ **D.** at the centre

Question 5 (Higher) A tangent to a circle is ... to the radius at the point of contact.

- ◯ **A.** parallel
- ◯ **B.** equal
- ◯ **C.** perpendicular
- ◯ **D.** opposite

Question 6 (Higher) The radius to a point has gradient 2. The tangent there has gradient

- ◯ **A.** 2

- ◯ **B.** -2
- ◯ **C.** $\frac{1}{2}$
- ◯ **D.** $-\frac{1}{2}$

Question 7 (Higher) The tangent to $x^2 + y^2 = 9$ at $(0, 3)$ is

- ◯ **A.** $x = 3$
- ◯ **B.** $y = 3$
- ◯ **C.** $y = -3$
- ◯ **D.** $y = x + 3$

Question 8 (Higher) Solving a line with a circle gives a quadratic with one repeated root. The line is

- ◯ **A.** a chord
- ◯ **B.** a diameter
- ◯ **C.** a tangent
- ◯ **D.** outside the circle

Question 9 (Higher) The circle passes through $(6, 8)$, centre origin. Its equation is

- ◯ **A.** $x^2 + y^2 = 14$
- ◯ **B.** $x^2 + y^2 = 10$
- ◯ **C.** $x^2 + y^2 = 48$
- ◯ **D.** $x^2 + y^2 = 100$

Question 10 (Higher) The tangent to $x^2 + y^2 = 25$ at $(3, 4)$ has gradient

- ◯ **A.** $\frac{4}{3}$
- ◯ **B.** $-\frac{4}{3}$
- ◯ **C.** $\frac{3}{4}$
- ◯ **D.** $-\frac{3}{4}$

Answer grid - Equation of a circle and tangents

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Question	Answer	Explanation
1	**C**	Radius squared on the right: 16.
2	**B**	Square root of 49.
3	**C**	16+9=25.
4	**B**	4+9=13 which is less than 16.
5	**C**	Tangent meets the radius at 90 degrees.
6	**D**	Negative reciprocal.
7	**B**	Radius is vertical so tangent is horizontal.
8	**C**	One point of contact.
9	**D**	36+64=100.
10	**D**	Radius gradient 4/3; negative reciprocal is -3/4.