Equations of Tangents of Circles GREEN

Find the equations of the tangents of the following circles at the points given.

|  |  |  |  |
| --- | --- | --- | --- |
| x² + y² = 49  at the point (-5, 5) | (x – 1)² + (y + 4)² = 25  at the point (4, 0) | (x - 8)² + (y – 1)² = 25  at the point (4, -2) | (x + 1)² + (y – 2)² = 25  at the point (3, 5) |
| (x - 2)² + (y – 6)² = 100  at the point (10, 0) | (x - 4)² + (y + 2)² = 25  at the point (4, 3) | x² + y² = 144  at the point (-9, -8) | (x – 7)² + (y + 5)² = 169  at the point (-5, 0) |

Equations of Tangents of Circles AMBER

Find the equations of the tangents of the following circles at the points given. Start by sketching each of the circles.

|  |  |  |  |
| --- | --- | --- | --- |
| x² + y² = 49  at the point (-5, 5)  Gradient of radius = -5 = -1  5  Gradient of tangent = | (x – 1)² + (y + 4)² = 25  at the point (4, 0)  Gradient of radius = \_\_\_    Gradient of tangent = | (x - 8)² + (y – 1)² = 25  at the point (4, -2) | (x + 1)² + (y – 2)² = 25  at the point (3, 5) |
| (x - 2)² + (y – 6)² = 100  at the point (10, 0) | (x - 4)² + (y + 2)² = 25  at the point (4, 3) | x² + y² = 144  at the point (-9, -8) | (x – 7)² + (y + 5)² = 169  at the point (-5, 0) |

Equations of Tangents of Circles RED

Find the equations of the tangents of the following circles at the points given. Start by sketching each of the circles.

|  |  |  |  |
| --- | --- | --- | --- |
| x² + y² = 49  at the point (-5, 5)  Gradient of radius = -5 = -1  5  Gradient of tangent = 1  y = mx + c  5 = 1 x -5 + c  10 = c  y = x + 10 | (x – 1)² + (y + 4)² = 25  at the point (4, 0)    Gradient of radius = 4  3  Gradient of tangent = -3  4 | (x - 8)² + (y – 1)² = 25  at the point (4, -2) | (x + 1)² + (y – 2)² = 25  at the point (3, 5) |
| (x - 2)² + (y – 6)² = 100  at the point (10, 0) | (x - 4)² + (y + 2)² = 25  at the point (4, 3) | x² + y² = 144  at the point (-9, -8) | (x – 7)² + (y + 5)² = 169  at the point (-5, 0) |