
GEOMETRY: EQUATION OF A TANGENT TO A CIRCLE**Best Guess Mastery Worksheet (Target Grade 8/9)****I Do**

22. The circle C has equation $x^2 + y^2 = 65$.

The point $A(4, -7)$ lies on the circle C .

Find the equation of the tangent to the circle at the point A .

Give your answer in the form $ax + by + c = 0$, where a , b , and c are integers.



GEOMETRY: EQUATION OF A TANGENT TO A CIRCLE**Best Guess Mastery Worksheet (Target Grade 8/9)****We Do**

The circle C has equation $x^2 + y^2 = 50$.

The point $B(-7, 1)$ lies on the circle C .

Find the equation of the tangent to the circle at the point B .

Give your answer in the form $ax + by + c = 0$, where a , b , and c are integers.

GEOMETRY: EQUATION OF A TANGENT TO A CIRCLE**Best Guess Mastery Worksheet (Target Grade 8/9)****You Do 1**

The circle C has equation $x^2 + y^2 = 34$.

The point $P(-3, -5)$ lies on the circle C .

Find the equation of the tangent to the circle at the point P .

Give your answer in the form $ax + by + c = 0$, where a , b , and c are integers.

GEOMETRY: EQUATION OF A TANGENT TO A CIRCLE**Best Guess Mastery Worksheet (Target Grade 8/9)****You Do 2**

The circle C has equation $x^2 + y^2 = 80$.

The point $Q(8, 4)$ lies on the circle C .

Find the equation of the tangent to the circle at the point Q .

Give your answer in the form $ax + by + c = 0$, where a , b , and c are integers.

Best Guess Mastery Worksheet (Target Grade 8/9)

Give your answer in the form $ax + by + c = 0$, where a , b , and c are integers.

GEOMETRY: EQUATION OF A TANGENT TO A CIRCLE**Best Guess Mastery Worksheet (Target Grade 8/9)****Challenge 2**

The circle C has equation $x^2 + y^2 - 4x + 6y - 12 = 0$.

The point $S(5, 1)$ lies on the circle C .

Find the equation of the tangent to the circle at the point S .

Give your answer in the form $ax + by + c = 0$, where a , b , and c are integers.

Answers & Worked Solutions

I Do:

1. Centre of circle is (0, 0).
2. Gradient of radius = $\frac{-7-0}{4-0} = -\frac{7}{4}$.
3. Gradient of tangent = $\frac{4}{7}$ (negative reciprocal).
4. Equation: $y - (-7) = \frac{4}{7}(x - 4) \rightarrow 7(y + 7) = 4(x - 4)$
5. Expand and rearrange: $7y + 49 = 4x - 16 \rightarrow 4x - 7y - 65 = 0$

We Do:

1. Centre of circle is (0, 0).
2. Gradient of radius = $\frac{1-0}{-7-0} = -\frac{1}{7}$.
3. Gradient of tangent = 7 (negative reciprocal).
4. Equation: $y - 1 = 7(x - (-7)) \rightarrow y - 1 = 7(x + 7)$
5. Expand and rearrange: $y - 1 = 7x + 49 \rightarrow 7x - y + 50 = 0$

You Do 1:

1. Centre of circle is (0, 0).
2. Gradient of radius = $\frac{-5-0}{-3-0} = \frac{5}{3}$.
3. Gradient of tangent = $-\frac{3}{5}$.
4. Equation: $y - (-5) = -\frac{3}{5}(x - (-3)) \rightarrow 5(y + 5) = -3(x + 3)$
5. Expand and rearrange: $5y + 25 = -3x - 9 \rightarrow 3x + 5y + 34 = 0$

You Do 2:

1. Centre of circle is (0, 0).
2. Gradient of radius = $\frac{4-0}{8-0} = \frac{1}{2}$.
3. Gradient of tangent = -2.
4. Equation: $y - 4 = -2(x - 8)$
5. Expand and rearrange: $y - 4 = -2x + 16 \rightarrow 2x + y - 20 = 0$

Challenge 1:

1. Centre of circle is (3, -2).
2. Gradient of radius = $\frac{2 - (-2)}{6 - 3} = \frac{4}{3}$.
3. Gradient of tangent = $-\frac{3}{4}$.
4. Equation: $y - 2 = -\frac{3}{4}(x - 6) \rightarrow 4(y - 2) = -3(x - 6)$
5. Expand and rearrange: $4y - 8 = -3x + 18 \rightarrow \mathbf{3x + 4y - 26 = 0}$

Challenge 2:

1. Complete the square to find centre: $(x - 2)^2 - 4 + (y + 3)^2 - 9 - 12 = 0 \rightarrow (x - 2)^2 + (y + 3)^2 = 25$.
2. Centre is (2, -3).
3. Gradient of radius = $\frac{1 - (-3)}{5 - 2} = \frac{4}{3}$.
4. Gradient of tangent = $-\frac{3}{4}$.
5. Equation: $y - 1 = -\frac{3}{4}(x - 5) \rightarrow 4(y - 1) = -3(x - 5)$
6. Expand and rearrange: $4y - 4 = -3x + 15 \rightarrow \mathbf{3x + 4y - 19 = 0}$