

Equation of a Circle and Line - SAMPLE

Thank you for your interest in my product. This Sample should give you a good idea of the quality of the material as well as the method of content presentation you will see in the complete version. Most of the content has been removed.

This Sample showcases the Teacher version that has all the blanks filled in. In the student version, anything that is bolded and enlarged here will not be present. I do this to ensure my students are engaged in the lesson but at the same time, aren't spending all their time writing. This leaves more time for discussion and practice.

Equation of a Circle

Circles: The equation of a circle with centre $(0,0)$ and radius r is: $x^2 + y^2 = r^2$
The radius of a circle is the distance from the centre of the circle to any point on the circle.

A) Finding the Radius of a Circle Given its Equation

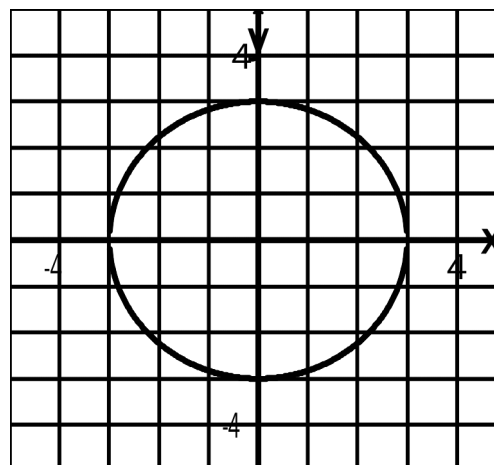
Example 1: Find the radius of a circle with centre $(0,0)$ and equation $x^2 + y^2 = 9$.
 Graph the circle.

The equation of the circle is $x^2 + y^2 = 9$.

$$\text{Since } r^2 = 9$$

$$r = 3$$

Since the radius of the circle is 3 and the centre is $(0, 0)$, to graph the equation, we can move 3 spaces. This section of the lesson has been removed.



B) Writing an Equation of a Circle given its Radius or a Point on the Circumference

Example 2: State an equation for the circle with centre $(0,0)$ and

a) radius 7 $x^2 + y^2 = r^2$ $x^2 + y^2 = 7^2$ $x^2 + y^2 = 49$	b) radius $\sqrt{5}$ This section of the lesson has been removed.	c) point $(-3,4)$ This section of the lesson has been removed.	d) point $(5, -12)$ $x^2 + y^2 = r^2$
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Equations of a Line

Recall: The equation of a line may be written in 3 forms:

1. Slope y intercept form: $y = mx + b$ where m = slope b = y-intercept	2. Standard Form $Ax + By + C = 0$ Where A, B and C must be integers (no fractions or decimals) and A must be positive	3. Point Slope Form This section of the lesson has been removed.
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Recall:

1. The equation of a vertical line is expressed in the form The x - intercept is a and the slope is undefined. $y = mx + b$ $a = mx + b$ $a = x$ $x = a$	2. The equation of a horizontal line is expressed in the form This section of the lesson has been removed.
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Example 1: Determine the equations of the following lines in slope y-intercept form and standard form.

a) through (2, 1) with slope -2 $y = mx + b$ sub x, y and m values in to find b $1 = -2(2) + b$ $1 + 4 = b$ $b = 5$ Rewrite with m and b values to find slope y-intercept equation Slope y-intercept $y = -2x + 5$ Rewrite in $Ax + By + C = 0$ to find the Standard Equation Standard Form $2x + y - 5 = 0$	b) through (4, -2) and (2, 1) $m = \frac{1 - (-2)}{2 - 4} \quad m = -\frac{3}{2}$ sub any x and y values in to find b $1 = -\frac{3}{2}(2) + b$ $1 = -\frac{3}{2}(2) + b$ $1 = -3 + b$ $1 + 3 = b = 4$ rewrite with m and b values to find slope y-intercept equation $y = -\frac{3}{2}x + 4$ Slope y -intercept rewrite in $Ax + By + C = 0$ to find the Standard Equation Standard Form $\rightarrow 2y = -3x + 8 \rightarrow 3x + 2y - 8 = 0$
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Example 2: Determine the equation of the following lines in standard form.

a) a vertical line through (2, -4) $x = 2$ $x - 2 = 0$	b) a horizontal line through (5, -5) This section of the lesson has been removed.
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Parallel and Perpendicular Lines

Recall:

Parallel lines are This section of the lesson has been removed.	Perpendicular lines are • Two lines whose slopes are negative reciprocals $\rightarrow 1, -\frac{1}{2}$ or This section of the lesson has been removed.
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Example 3: Given the following pairs of slopes, determine whether they are parallel, perpendicular or neither.

a) $m_1 = 2, m_2 = 2$ Parallel	b) $m_1 = 2, m_2 = \frac{1}{2}$ Neither	c) $m_1 = 2, m_2 = -\frac{1}{2}$ This section of the lesson has been removed.	d) $m_1 = \text{und}, m_2 = \text{und}$ Parallel	e) $m_1 = \text{und}, m_2 = 0$ This section of the lesson has been removed.
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**note – if slope is undefined $\rightarrow \frac{1}{0}$ ($x = 0$) because 0 will go into 1 infinite times, if the slope is 0 $\rightarrow \frac{0}{1}$ ($y = 0$) because 1 will never go into 0

Example 4: Complete the table below.

Equation	Slope	Slope of a Line Parallel to the given Line	Slope of a Line Perpendicular to the given Line
$y = -2x - 3$	-2	These sections of the lesson have been removed.	
$y = \frac{2}{3}x + 1$	$\frac{2}{3}$		
$x = 2$	Undefined		
$y = -2$	0		

Example 5: Determine the equation of a line in point-slope form that is parallel to

$3x - 4y + 5 = 0$, with the same x intercept as

This section of the lesson has been removed.

1. Since the line is parallel to $3x - 4y + 5 = 0$, it has the same slope. Find the slope of $3x - 4y + 5 = 0$ This section of the lesson has been removed.	2. The x-intercept is the same as $2x + 10y = 10$. This section of the lesson has been removed.	3. Use the slope y-intercept equation to determine the equation of the line. $y = mx + b$ <i>sub x and y values in to find b</i> $0 = \frac{3}{4}(5) + b$ This section of the lesson has been removed.
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Example 6: Determine the equation **This section of the lesson has been removed.**

1. Since the line is perpendicular to $y = -\frac{2}{3}x + 4$, the slopes are negative reciprocals. Therefore, This section of the lesson has been removed.	2. The y-intercept is the same as $y = 2x - 3$. Set $x = 0$ This section of the lesson has been removed.	3. Use the slope-y-intercept equation to determine the equation of the line. Sub in the slope and b value $y = mx + b$ $y = \frac{3}{2}x - 3$ Standard form Multiply each term by 2 to eliminate the fraction $2y = 3x - 6$ Set the correct order $3x - 2y - 6 = 0$
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