Mathematics 10D

2.3 – Circles

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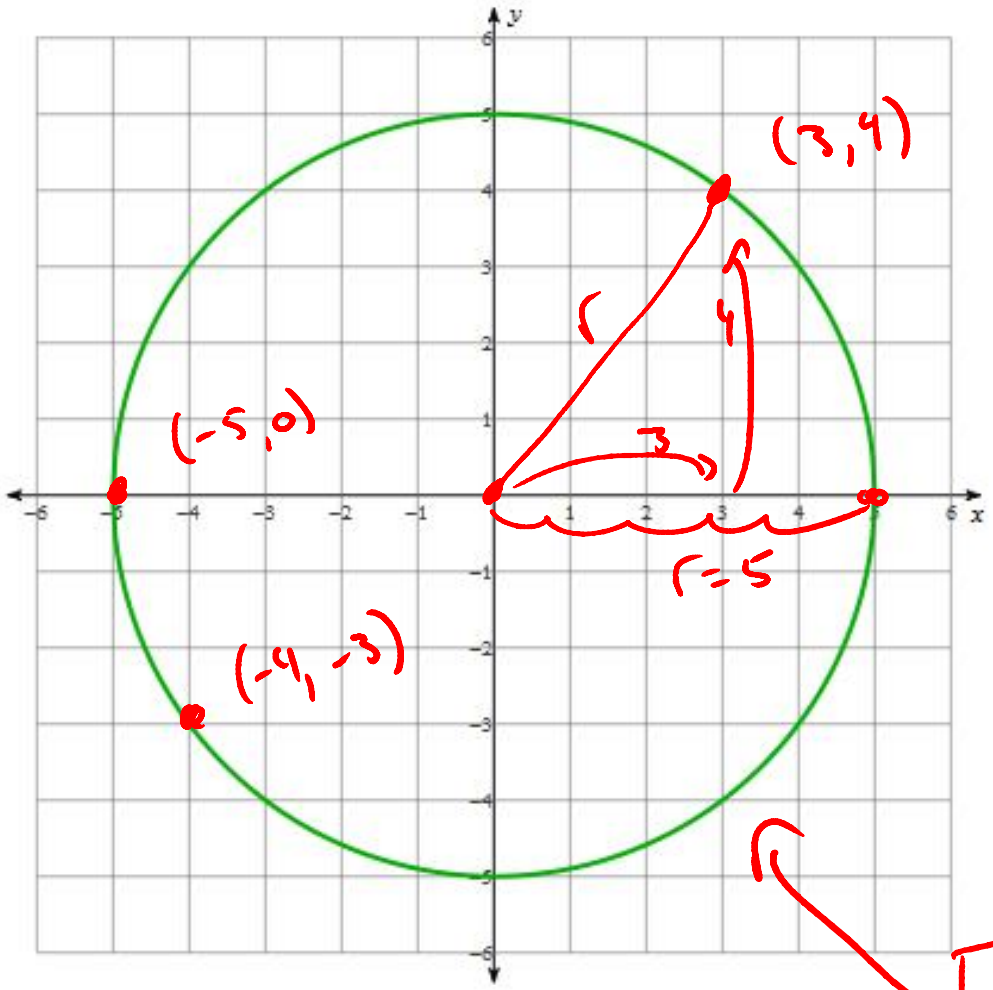
A Circle centred around origin at (0,0):



$3^2 + 4^2 = r^2$

$9 + 16 = r^2$

$25 = r^2$

$5 = r$

$$x^2 + y^2 = r^2$$

Equation of a circle

$$x^2 + y^2 = 25$$

Write the equation of the circle given:

$r = 8$

$x^2 + y^2 = r^2$

$x^2 + y^2 = 8^2$

$x^2 + y^2 = 64$

$(\overset{x}{-3}, \overset{y}{7})$

$x^2 + y^2 = r^2$

$(-3)^2 + (7)^2 = r^2$

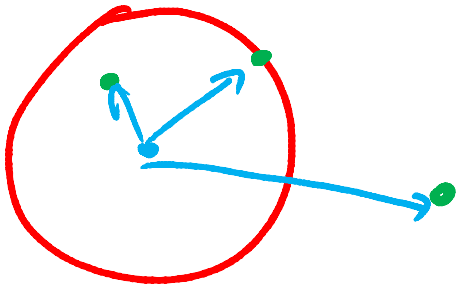
$9 + 49 = r^2$

$58 = r^2$

$\therefore x^2 + y^2 = 58$

Given the circle $x^2+y^2=61$, determine if the following points are inside, on or outside the circle:

r^2



A(2,4)

$x^2+y^2=r^2$

$2^2+4^2=r^2$

$4+16=r^2$

$20=r^2$

$20<61$

$\therefore$ inside circle

B(7,-5)

$x^2+y^2=r^2$

$7^2+(-5)^2=r^2$

$49+25=r^2$

$74=r^2$

$74>61$

$\therefore$ outside circle

C(5,-6)

$x^2+y^2=r^2$

$5^2+(-6)^2=r^2$

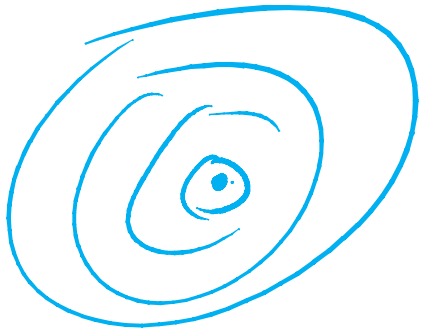
$25+36=r^2$

$61=r^2$

$61=61$

$\therefore$ on circle.

Last Question: A stone is dropped into a pond, creating a circular ripple. The radius of the ripple increases by 4cm/s. Determine an equation that models the circular ripple after 10 seconds.



$4 \times 10 = 40\text{cm}$ = the distance from the centre, or the radius

$\therefore x^2 + y^2 = 40^2$

$x^2 + y^2 = 1600$