

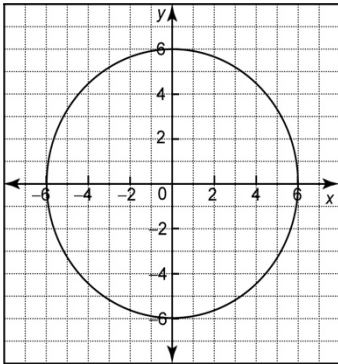
**W3 – Equation of a Circle**

MPM2D

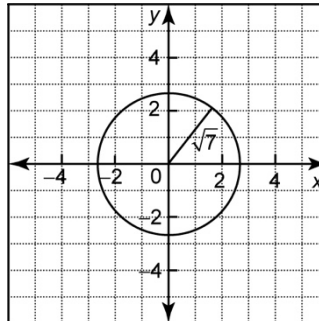
Jensen

**1) Determine the equation of each circle.**

a)



b)

**2) State the radius of each of the following circles.**

a)  $x^2 + y^2 = 49$

b)  $x^2 + y^2 = 16$

c)  $x^2 + y^2 = 64$

d)  $x^2 + y^2 = 1.44$

**3) Find an equation for the circle centred at the origin that passes through each point.**

a)  $(3, -4)$

b)  $(-5, 2)$

4) Determine whether each point is on, inside, or outside the circle defined by  $x^2 + y^2 = 26$ .

a) (1, 3)

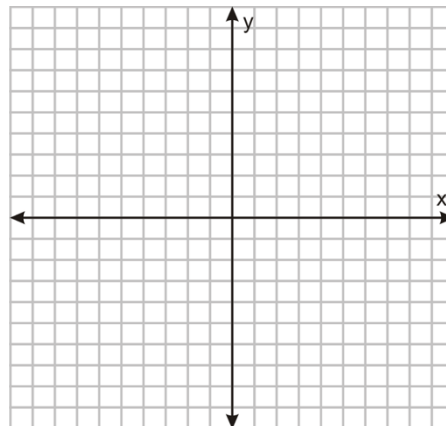
b) (-4, 6)

c) (1, 5)

5) The point  $A(4, b)$  lies on the circle defined by  $x^2 + y^2 = 25$ .

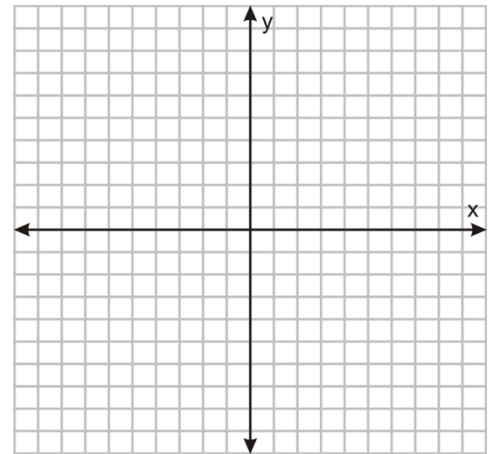
a) Find the possible value(s) of  $b$ .

b) Use a graph to show that the point(s) corresponding to the possible value(s) of  $b$  are on the circle.



**6)a)** Graph the circle defined by  $x^2 + y^2 = 45$ .

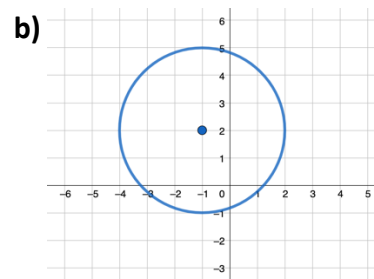
**b)** Verify algebraically that the line segment joining  $P(-3, 6)$  and  $Q(6, -3)$  is a chord of this circle. (In other words, verify that P and Q are points on the circle)



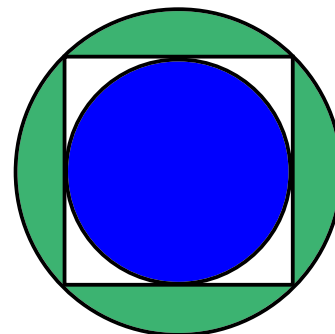
**c)** Find an equation in the form  $y = mx + b$  for the right bisector of chord PQ.

**7)** Determine an equation for each of the following circles.

**a)** centered at  $(4,3)$  with a radius of 5

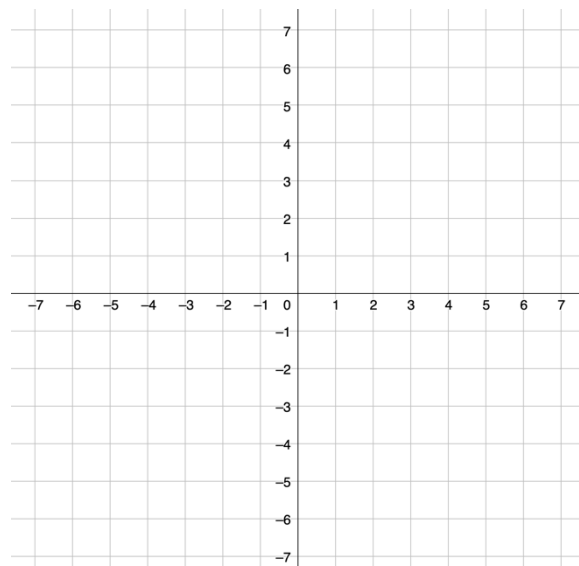


8) An equation for the small circle in this diagram is  $x^2 + y^2 = 4$ . Determine the equation for the larger circle.



9)a) Graph the circle defined by  $x^2 + y^2 = 41$ .

b) Verify algebraically that the line segment joining  $U(-4,5)$  and  $V(-5,-4)$  is a chord of this circle.



c) Determine an equation for the line that passes through the origin and is perpendicular to the chord  $UV$ .

d) Verify that this line passes through the midpoint of the chord.

## Answers

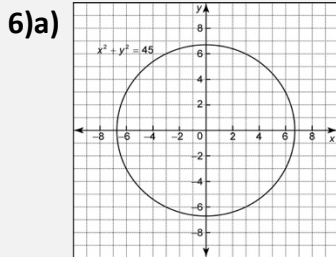
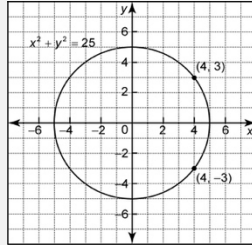
1)a)  $x^2 + y^2 = 36$  b)  $x^2 + y^2 = 7$

2)a) 7 b) 4 c) 8 d) 1.2

3)a)  $x^2 + y^2 = 25$  b)  $x^2 + y^2 = 29$

4a) inside b) outside c) on

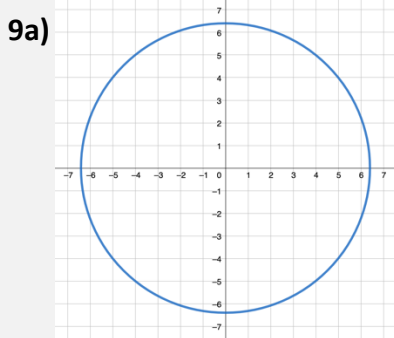
5a) (4, 3) and (4, -3) b)



b) see solution for steps c)  $y = x$

7)a)  $(x - 4)^2 + (x - 3)^2 = 25$  b)  $(x + 1)^2 + (y - 2)^2 = 9$

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



b) see solutions c)  $y = -\frac{1}{9}x$  d) The line passes through the midpoint  $(-\frac{9}{2}, \frac{1}{2})$