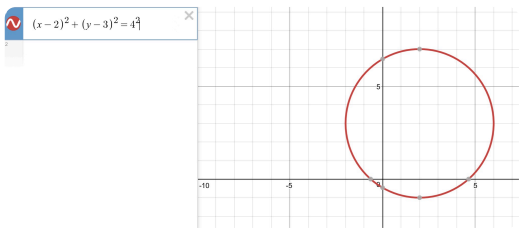
Intro to circle

$x^2 + y^2 = r^2$ circle centre $(0,0)$
radius r

$(x-a)^2 + (y-b)^2 = r^2$
circle centre (a,b)



Exercise Identify centre and radius

		centre	radius
1)	$x^2 + y^2 = 16$	$(0,0)$	4
2)	$(x-1)^2 + (y-2)^2 = 3^2$	$(1,2)$	3
3)	$(x+4)^2 + (y-1)^2 = 19$	$(-4,1)$	$\sqrt{19}$
4)	$(x+7)^2 + y^2 = 36$	$(-7,0)$	6
5)	$(x+\sqrt{3})^2 + (y-\sqrt{5})^2 = \sqrt{7}^2$	$(-\sqrt{3}, \sqrt{5})$	$\sqrt{7}$

Eqn of circle

Ex1 $x^2 + y^2 + 6x - 8y - 100 = 0$

$x^2 + 6x + y^2 - 8y - 100 = 0$

$(x+3)^2 - 9 + (y-4)^2 - 16 - 100 = 0$

$(x+3)^2 + (y-4)^2 = 125$

$$(x+3)^2 + (y-4)^2 = \sqrt{125}^2$$

Circle centre $(-3,4)$ radius $\sqrt{125}$

Exercise

$$x^2 + y^2 - 10x - 50 = 0$$

$$x^2 - 10x + y^2 - 50 = 0$$

$$(x-5)^2 - 25 + y^2 - 50 = 0$$

$$(x-5)^2 + y^2 = 75$$

Circle centre $(5,0)$ radius $\sqrt{75}$

Ex 6A Q3 $P(-4,6)$ and $Q(7,8)$

Line segment PQ is diameter of circle

Find eqn of circle

Centre $\left(\frac{-4+7}{2}, \frac{6+8}{2}\right) = \left(\frac{3}{2}, 7\right)$

Diameter $= \sqrt{(7--4)^2 + (8-6)^2}$

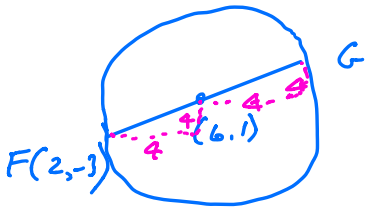
$= \sqrt{121+4} = \sqrt{125} = 5\sqrt{5}$

Radius $= \frac{5\sqrt{5}}{2}$

Eqn of circle $= \left(x - \frac{3}{2}\right)^2 + (y-7)^2 = \left(\frac{5\sqrt{5}}{2}\right)^2$

$= \left(x - \frac{3}{2}\right)^2 + (y-7)^2 = \frac{125}{4}$

Q 8



$G(10, 5)$

Q10 $M(3,p)$ $N(q,4)$ on circle centre $(5,6)$

MN diameter so midpoint $= (5,6)$

$$\left(\frac{3+q}{2}, \frac{p+4}{2}\right) = (5,6)$$

$\frac{3+q}{2} = 5$ $\qquad$ $\frac{p+4}{2} = 6$

$3+q = 10$ $\qquad$ $p+4 = 12$

$\underline{q = 7}$ $\qquad$ $\underline{p = 8}$

Find eqn of the circle

Circle of form $(x-5)^2 + (y-6)^2 = r^2$

$M(3,8)$ on circle

$$\therefore \quad (3-5)^2 + (8-6)^2 = r^2$$
$$4 + 4 = r^2$$
$$8 = r^2$$
$$\sqrt{8} = r$$

Circle is $(x-5)^2 + (y-6)^2 = 8$

Hwk Read pages 113 - 123