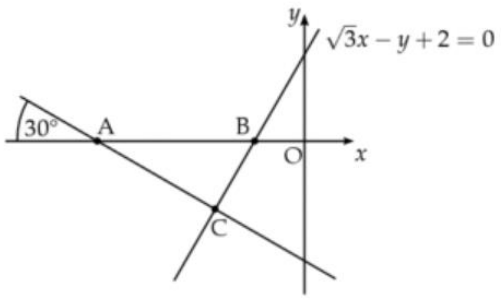
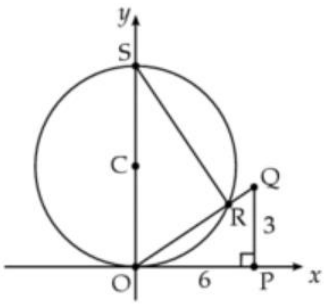
Higher Maths - Homework 1 **Name** _____

1. The diagram below shows two lines which intersect at the point C.



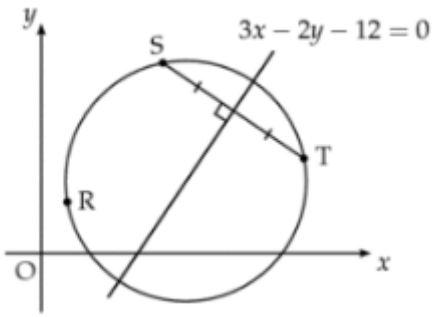
Show that triangle ABC is right angled at C. **4**

2. The diagram below shows the right-angled triangle OPQ and a circle with centre $C(0,5)$ and diameter OS.



Find the equation of the chord RS. **5**

3. The points $R(1,2)$, $S(5,8)$ and $T(11,4)$ lie on the circumference of a circle.



The line with equation $3x-2y-12=0$ in the perpendicular bisector of ST.

(a) Find the equation of the perpendicular bisector of RS. **4**

The centre of the circle is the point where the perpendicular bisectors of RS and ST intersect.

(b) Calculate the coordinates of the centre of the circle. **3**

4. The points $A(3,2)$, $B(2a,12)$ and $C(a,-1)$ are collinear.

Find the value of the constant a. **4**

Answers to Homework 1 – Straight lines

1. Since $m_{BC} \times m_{AC} = \sqrt{3} \times -\frac{1}{\sqrt{3}}$, AC and BC are perpendicular and ABC is right-angled at C.

2. $y + 2x = 10$ (or equivalent)

3(a) $3y + 2x = 21$ (or equivalent) **3(b)** Centre at $(6, 3)$

4. $a = \frac{39}{16}$