



Additional Math with Ali Hashir

## Coordinate Geometry of the Circle

### Worksheet 1 — Answers

**Q1.** (a) Centre  $(2, -5)$ , radius 10. (b) The point  $(10, 1)$  lies **on** the circle.

**Q2.** Centre  $(3, -5)$ , radius 4.

**Q3.**  $(x - 3)^2 + (y + 4)^2 = 25$ .

**Q4.**  $P = (0, 0)$ ,  $Q = (10, 0)$ .

**Q5.**  $(x - 1)^2 + (y - 4)^2 = 25$ .

**Q6.** (a) Shown (see solutions). (b)  $4x + 3y = 60$ .

**Q7.**  $m = 6$ ,  $n = -4$  (or equivalently  $m = -4$ ,  $n = 6$ ).

**Q8.** (a) Shown (see solutions). (b)  $(2, 8)$  and  $(7, 3)$ .

**Q9.** The perpendicular distance from the centre to the line equals the radius ( $5 = 5$ ), so the line is a **tangent**.

**Q10.** (a)  $k = 1$  or  $k = -\frac{3}{5}$ . (b)  $(x - 1)^2 + (y - 3)^2 = 8$ .

**Q11.** Shown (see solutions).

**Q12.** (a)  $l_1 : y = 2x + 7$ ,  $l_2 : y = -2x + 15$ . (b)  $P = (-2, 3)$ ,  $Q = (6, 3)$ ,  $PQ = 8$ .

**Q13.** (a) 5. (b)  $PQ = 24$ .

**Q14.** (a)  $x + y - 7 = 0$ . (b)  $P = (3, 4)$ ,  $Q = (5, 2)$ .

**Q15.**  $(x - 1)^2 + (y - 1)^2 = 36$  or  $(x - 7)^2 + (y - 7)^2 = 36$ .

**Challenge 1.** (a)  $4x - 3y - 5 = 0$ . (b)  $(x - 8)^2 + (y - 9)^2 = 50$ . (c) Area of  $\triangle ABC = 25$ .

**Challenge 2.** (a)  $3x - 4y = 0$ . (b)  $P = (0, 0)$ ,  $Q = (8, 6)$ . (c) Area of kite  $APBQ = 75$ .