

Geometry Exercise

1. Find the gradient of the line which passes through the points A(-1, -2) and B(2, 10)
2. Find the equation of the line which passes through (3, 4) and has gradient 3
3. a) Find the gradient AB where A(-2, 9) and B(3, -1)
b) hence find the equation of the line which passes through points A and B.
4. Find the equation of the line which passes through (-1, 1) and (3, 13)
5. a) Find the length of the line PQ where P has coordinate (-1, 4) and Q has coordinate (5, 12)
b) find the midpoint of the line PQ
6. The points (4, 7) and (8, 1) are the ends of a diameter of a circle C.
(a) Find the equation of C.
(b) Find the equation of the tangent to C at the point (8, 1)
7. The points A, B, C and D have coordinates (-2, -9) (3, 6) , (1, 5) and (-3, 3), respectively.
a) Show that the equation of the line AB is given by
$$y = 3x - 3$$
And find the equation of the line CD
b) Find the point of intersection of the line AB with the line CD
8. The points A, B and C have coordinates (1, -4) (5, 4) and (7, 3), respectively.
a) Show that the equation of the line BC is given by
$$2y + x = 13$$
And find the equation of the line AB
b) Show that the two lines are perpendicular to each other.
c) Find the exact values for the length of the lines AB and BC
d) Hence find the area of the triangle ABC

9. For each of the following circles state the centre and radius

(i) $x^2 + y^2 = 25$

(ii) $(x-2)^2 + (y+2)^2 = 9$

(iii) $(x+4)^2 + (y-1)^2 = 36$

(iv) $(x-5)^2 + (y-1)^2 = 16$

(v) $(x+3)^2 + (y+1)^2 = 8$

10. Show that the equation $x^2 + y^2 + 2x - 4y - 4 = 0$ represents a circle. State its centre and radius.

11. Show that the equation $x^2 + y^2 - 8x - 10y + 20 = 0$ represents a circle. State its centre and radius.

12. A circle has equation $(x-3)^2 + (y-2)^2 = 8$

a) Show that the point (5, 4) lies on the circle

A tangent is drawn onto the circle at Point P (5, 4)

b) Obtain an expression for the equation of this tangent