

MATH141 - Worksheet GEOMETRY

This worksheet is to be used in conjunction with pages 1-19 to 1-22 in 'Notes for Mathematics 1C Part 1'.

1. For each of the following pairs of points, find:
(i) the distance between them (ii) the midpoint of each interval
(iii) the gradient of the line passing through each pair.
(a) (4, 5) and (2, 1) (b) (3, 2) and (5, 1) (c) (-2, 4) and (3, 3) (d) (-1, 2) and (3, 4)
(e) (4, -3) and (0, -1) (f) (3, 5) and (1, 5) (g) (2, 4) and (5, -2) (h) (4, 3) and (4, 7)

2. Find the equation of the straight line given:
(a) gradient 2, y intercept 5 (b) gradient $\frac{1}{2}$, y intercept -3
(c) gradient -3, y intercept 4 (d) gradient $\frac{1}{3}$, y intercept 4
(e) the point (1, 4) with gradient 3 (f) the point (2, 1) with gradient 2
(g) the point (3, -2) with gradient -2 (h) the point (5, -2) with gradient 2
(i) the points (4, 2) and (3, 1) (j) the points (2, 3) and (4, 1)
(k) the points (5, -1) and (2, -2)

3. Find the equation of the line:
(i) parallel to, and (ii) perpendicular to
(a) $y = 2x + 3$ with y intercept 1
(b) $y = -3x + 2$ and passing through the point (1, 3)
(c) $x + y = 4$ and passing through the point (2, 4)
(d) the interval joining (4, 2) and (2, 1) with y intercept 3

4. Name, but do not draw, the curve that is represented by each of the equations.
(a) $x^2 + y^2 = 9$ (b) $y = \frac{4}{x}$ (c) $y = 3^x$ (d) $x = 3$
(e) $y = 2x^2 + 3x + 4$ (f) $3x + y = 8$ (g) $y = \sqrt{16 - x^2}$ (h) $y = \log_{10} x$
(i) $xy = -2$ (j) $y = -2$ (k) $(x - 2)^2 + (y + 1)^2 = 9$ (l) $y = x^2 + 4$

5. Sketch the graphs of the following functions.
(a) $f(x) = |x - 1|$ (b) $f(x) = |x| - 1$ (c) $f(x) = |x + 1|$ (d) $f(x) = 1 - |x|$
(e) $x^2 + y^2 = 4$ (f) $(x - 2)^2 + (y - 3)^2 = 25$ (g) $y = \sqrt{9 - x^2}$ (h) $y = -\sqrt{4 - x^2}$
(i) $x^2 + 2x + y^2 + 2y = 2$ (j) $x^2 - 4x + y^2 + 2y = 4$ (k) $x^2 + y^2 + 4x + 2y - 5 = 0$
(l) $y = x^2$ (m) $y = -x^2$ (n) $x = y^2$ (o) $x = -y^2$
(p) $y = x^2 + 2$ (q) $y = (x - 2)^2$ (r) $y = 2x^2 + 4x + 3$ (s) $x = y^2 + 2y + 1$
(t) $xy = 2$ (u) $y = \frac{-3}{x}$ (v) $y = 2^x$ (w) $y = \log_2 x$