

MAS051 — Example Sheet 5

To be handed in: Friday, October 25, 2002

Remember to give your Tutorial Group, along with your name, on the assignment. Only the *asterisked* (starred) questions will be marked. You should only use a calculator to check your solutions (if at all).

1 In the case of each of the following pairs of straight lines, determine whether the lines are parallel or perpendicular or neither. In the cases where the lines are not parallel, find the point of intersection.

- (a) $2x - 3y + 1 = 0$; $4x - 6y + 3 = 0$; (d)* $2x + 3y - 1 = 0$; $x - 2y + 3 = 0$;
(b)* $x + 2y + 4 = 0$; $x - 3y + 2 = 0$; (e) $x + 4y - 3 = 0$; $3x - 2y + 1 = 0$;
(c) $x + 2y + 3 = 0$; $3x + 6y + 1 = 0$; (f)* $3x + 4y - 7 = 0$; $2x + 5y + 7 = 0$.

2 In each of the following cases, find the equation of the straight line which is perpendicular to the given straight line and passes through the given point.

- (a) $3x - 4y + 1 = 0$; $(5, 2)$; (e) $5x - 3y = 8$; $(2, -3)$;
(b)* $2x - 5y + 7 = 0$; $(3, 1)$; (f)* $3x - 4y = 5$; $(0, 0)$;
(c) $y = 2x + 1$; $(2, 3)$;
(d)* $x + 3y = 4$; $(-2, 1)$; (g) $7x + 2y - 2 = 0$; $(-1, -2)$.

3 Find the points of intersection of each of the following pairs of straight lines:

- (a) $x + y = 1$, $2x - y = 5$; (b)* $3x - y = 4$, $x = y - 2$; (c) $y = 2x$, $x - 4y = 7$.

4 In each of the following cases, find the distance between the given point and the given straight line:

- (a) $(2, 1)$, $3x + 4y + 5 = 0$; (d) $(0, 0)$, $y = mx + a\sqrt{1 + m^2}$;
(b)* $(1, -2)$, $5x + 12y - 7 = 0$;
(c)* $(-2, -3)$, $x - 2y + 6 = 0$; (e)* $(0, 0)$, $x/a + y/b = 1$.

AJD September 26, 2002