ALGEBRA

1 Solve each pair of simultaneous equations.

a $y = 3x$
$y = 2x + 1$

b $y = x - 6$
$y = \frac{1}{2}x - 4$

c $y = 2x + 6$
$y = 3 - 4x$

d $x + y - 3 = 0$
$x + 2y + 1 = 0$

e $x + 2y + 11 = 0$
$2x - 3y + 1 = 0$

f $3x + 3y + 4 = 0$
$5x - 2y - 5 = 0$

2 Find the coordinates of the points of intersection of the given straight line and curve in each case.

a $y = x + 2$
$y = x^2 - 4$

b $y = 4x + 11$
$y = x^2 + 3x - 1$

c $y = 2x - 1$
$y = 2x^2 + 3x - 7$

3 Solve each pair of simultaneous equations.

a $x^2 - y + 3 = 0$
$x - y + 5 = 0$

b $2x^2 - y - 8x = 0$
$x + y + 3 = 0$

c $x^2 + y^2 = 25$
$2x - y = 5$

d $x^2 + 2xy + 15 = 0$
$2x - y + 10 = 0$

e $x^2 - 2xy - y^2 = 7$
$x + y = 1$

f $3x^2 - x - y^2 = 0$
$x + y - 1 = 0$

g $2x^2 + xy + y^2 = 22$
$x + y = 4$

h $x^2 - 4y - y^2 = 0$
$x - 2y = 0$

i $x^2 + xy = 4$
$3x + 2y = 6$

j $2x^2 + y - y^2 = 8$
$2x - y = 3$

k $x^2 - xy + y^2 = 13$
$2x - y = 7$

l $x^2 - 5x + y^2 = 0$
$3x + y = 5$

m $3x^2 - xy + y^2 = 36$
$x - 2y = 10$

n $2x^2 + x - 4y = 6$
$3x - 2y = 4$

o $x^2 + x + 2y^2 - 52 = 0$
$x - 3y + 17 = 0$

4 Solve each pair of simultaneous equations.

a $x - \frac{1}{y} - 4y = 0$
$x - 6y - 1 = 0$

b $xy = 6$
$x - y = 5$

c $\frac{3}{x} - 2y + 4 = 0$
$4x + y - 7 = 0$

5 The line $y = 5 - x$ intersects the curve $y = x^2 - 3x + 2$ at the points P and Q.
Find the length PQ in the form $k\sqrt{2}$.

6 Solve the simultaneous equations

$$3^{x-1} = 9^{2y}$$
$$8^{x-2} = 4^{1+y}$$

7 Given that

$$(A + 2\sqrt{3})(B - \sqrt{3}) \equiv 9\sqrt{3} - 1,$$

find the values of the integers A and B.