Collinearity and parallel/perpendicular lines

1. Which of these sets of coordinates are collinear?

(a) A(4, 5), B(2, 1) and C(8, 13)

(b) D(2, -1), E(3, 7) and F(11, 9)

(c) G(-3, 2), H(5, 4) and I(9, 5)

2. The points (2, 0), (k, 5) and (9, 8) are collinear. Find the value of k.

3. If the points (-1, 2), (3, 5) and (2, m) are collinear, find the value of m.

4. Each of the following lines is parallel to another line. Match up the pairs.

(a) $y = 2x - 1$	(b) $4x + 2y = 5$	(c) $3y + x - 2 = 0$
(d) $4y + 8x - 2 = 0$	(e) $2y = 4x$	(f) $5x - 2y = 4$
(g) $3y = 5 - x$	(h) $10x = 4y - 8$	

5. Find the equation of the line parallel to $y = 2x - 3$ and passing through the point (2, -1).

6. Find the equation of the line parallel to $2x + 5y = 10$, passing through the point (-3, 0)

7. Write down the perpendicular gradient when:

(a) $m = 3$	(b) $m = 7$	(c) $m = -5$	(d) $m = 1$
(e) $m = \frac{2}{5}$	(f) $m = \frac{3}{4}$	(g) $m = -\frac{4}{3}$	(h) $m = 0$

8. Write down the gradient of the line perpendicular to $y = 2 - 3x$.

9. What is the gradient of the line perpendicular to $2y - 4x = 7$.

10. What is the equation of the line perpendicular to $y = \frac{1}{4}x + 5$ passing through the point (5, 9)?

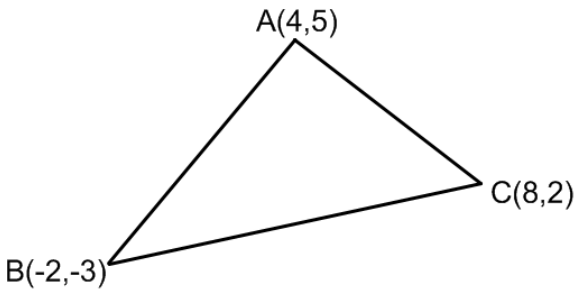
11. Find the equation of the line perpendicular to $2y + 3x = 5$ passing through the point (2, 8).

12. Are the lines $3y + 2x = 5$ and $2y = 4 + 3x$ parallel or perpendicular? Explain why.

13. The lines $3y = 2x + 1$ and $y = kx + 4$ are perpendicular. Find the value of k.

14. The line $2x + 4y = 5$ is perpendicular to the line $3y = px + 4$. What is the value of p?

15. Is the triangle shown right angled?



16. (a) Find the equation of the line AB in the diagram given that AB is perpendicular to AC.

(b) The x-coordinate of B is half way between A and C. Write down the coordinate for B.