MAS051 — Test 2

You should attempt all the questions.

1. Find the equation of the straight line with gradient $-2/5$ passing through the point $(-4, 6)$.

2. Find the gradient of the straight line $-6x + 4y = -17$.

3. Find the equation of the straight line passing through points $(21, 3)$ and $(19, 9)$.

4. Find the equation of the straight line through the point $(3, 9)$ and parallel to the straight line $3y + 10x = 4$.

5. Find the equation of the straight line through the point $(1, 12)$ and perpendicular to the straight line $4x - 3y = 16$.

6. Determine whether each of the following pairs of straight lines is parallel, perpendicular or neither.

   (a) $4x - 12y = 7$ and $12x - 4y = -5$;

   (b) $15x - 7y = 10$ and $-30x + 14y = 7$;

   (c) $5x - 4y = 1$ and $4x + 5y = 9$.

7. Express the following angles in radians (i.e. in terms of π).

   (a) 30° (b) 135° (c) 300°

8. Express the following angles in degrees.

   (a) $\frac{5\pi}{4}^c$ (b) $\frac{-11\pi}{6}^c$ (c) $-\frac{2\pi}{5}^c$

9. Use trigonometric identities to simplify the following.

   (a) $\dfrac{1 - \cos^2(\theta)}{\sin(\theta)}$ (b) $\dfrac{\sin((\pi/2) - \theta)}{\cos((\pi/2) - \theta)}$

10. A triangle has sides a, b, c opposite angles A, B, C, respectively, where

$$A = \frac{\pi}{3}, \quad b = 27 \quad \text{and} \quad c = 36.$$

    Find a, B and C.