MAS051 — Test 1 — Sample

You should attempt all the questions.

Write your answers in the space provided, showing your working.

You may *not* use a calculator.

1. Evaluate
$$11 + (15 \div 5) \times ((8 - 3) - (9 - 2))$$

2. Expand, and simplify if possible,
$$(5x + 3y)(2x - 3y)$$

3. Express the following as fractions in their lowest form:
   (a) $\frac{2}{7} + \frac{3}{5}$ (b) $\frac{8}{27} \div \frac{12}{21}$

4. Simplify the following giving your answer as a power of a natural number:
   (a) $47^6 \times 47^{11}$ (b) $(43^5)^9$

5. Express each of the following in the form a^x (i.e. find x):
   (a) $\frac{a^2 a^4}{\sqrt[3]{a^7}}$ (b) $\sqrt{a^3/a^5}$

6. Simplify the following expressions:
   (a) $\frac{x}{2x-3} - \frac{1}{x+4}$ (b) $\frac{5x^6 - 4x^5 + 23x^2}{x^2(4x-2)}$

7. Solve the following equations for y:
   (a) $4y + 13 = 5y + 2$ (b) $(y + 6)(y - 3) = (y + 5)(y + 3)$

8. Solve the simultaneous equations:
$$3x - 4y = -1 \text{ and}$$
$$4x + 5y = 9$$

9. Which of the following lines contains the point $(6, 1)$? Answer Yes or No in each case.
   (a) $y = 4x - 23$ (b) $y = 3x - 19$

10. Find the equation, in the form $y = mx + c$, of the straight line with gradient -5 passing through the point $(4, -2)$.