# Test Two

This is a self-diagnostic test. Every pair of questions relates to a worksheet in a series available in the MUMS the WORD series. For example question 5 relates to worksheet 2.5 *Arithmetic with Surds*. If you score 100% on this test and test 1 then we feel you are adequately prepared for your introductory mathematics course. For those of you who had trouble with a few of the questions, we recommend working through the appproriate worksheets and associated computer aided learning packages in this series.

1. (a) Find the highest common factor of $6uvw$ and $18uv$, where $u$, $v$, and $w$ are prime numbers.
   (b) Factorize $3xy + 6y + 3y^2$
2. (a) Solve for $x$, $\frac{x}{4} = 3$
   (b) Solve for $y$, $6(y + 2) = 30$
3. (a) Simplify $\frac{2}{x+2} + \frac{3}{x}$
   (b) Solve for $x$ in the equation $\frac{2x+2}{3x+5} = 2$
4. (a) Draw $x > -3$ on the number line.
   (b) Rewrite $|x| > 3$ without the absolute value signs.
5. (a) Simplify $(1 + \sqrt{2})(1 - \sqrt{2})$
   (b) Rationalize the denominator: $\frac{1}{2+\sqrt{2}}$
6. (a) i. Factorize $x^2 + 6x + 8$
      ii. Simplify $\frac{x+3}{x^2-9}$
   (b) i. Is $x - 3$ a factor of $x^3 - 27$?
      ii. Factorize $x^3 + x^2 + x - 14$ as far as you can with integer coefficients.
7. (a) If $\log_2 \frac{x}{8} = 3$, what is $x$?
   (b) Simplify $3 \log e^y$
8. (a) In diagram A below, what is $\theta$?
   (b) In diagram B below, what is $\sin\theta$, $\cos\theta$, and $\tan\theta$? What is $\theta$?

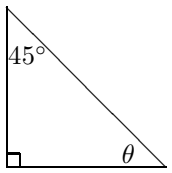


Diagram A

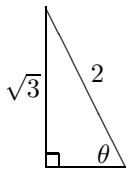


Diagram B

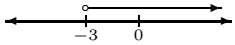
9. (a) If I drew $y = 5x + 3$ on graph paper, what would it look like?
   (b) What is the slope and the $y$-intercept of the line $3y = 5x + 2$?

Answers to Test Two

1. (a) $6uv$ (b) $3y(x+y+2)$

2. (a) $x = 12$ (b) $y = 3$

3. (a) $\frac{5x+6}{x(x+2)}$ (b) $x = -2$

4. (a) 

(b) $x < -3$ or $x > 3$

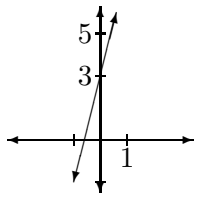
5. (a) $-1$ (b) $\frac{2-\sqrt{2}}{2}$

6. (a) i. $(x+2)(x+4)$
ii. $\frac{1}{x-3}$
(b) i. Yes
ii. $(x-2)(x^2+3x+7)$

7. (a) $x = 64$ (b) $3y$

8. (a) $45°$

(b) $\sin\theta = \frac{\sqrt{3}}{2}$ $\tan\theta = \sqrt{3}$
$\cos\theta = \frac{1}{2}$ $\theta = 60°$

9. (a) 


(b) Slope $\frac{5}{3}$ and the $y$-intercept is $\frac{2}{3}$