## L2 Algebra Practice #4

1.  Solve:  $x = \log_4(1024)$

2.  Solve:  $\dfrac{x+3}{5} < \dfrac{x+5}{2}$

3.  Solve:  $(2x - 1)(2x - 3) = 8$

4.  The height of a door is one metre more than its width. The area of the door is 1.44 m$^2$. What are the dimensions of the door?

5.  Write as one simplified log term:  $\log_x(9) - 3\log_x(3)$

6.  Simplify:  $\dfrac{2x^2 - 5x + 2}{x - 2}$

7.  Make $x$ the subject of:  $4y = \dfrac{2x - 1}{3}$

8.  Show that $(3^x)^3 = 27^x$

## Answers: L2 Algebra Practice #4

1.     $x = \log_4(1024)$         If $y = b^x$ then $\log_b y = x$    $1024 = 4^x$         **$x = 5$**

2.     $\dfrac{x+3}{5} < \dfrac{x+5}{2}$         $2(x+3) < 5(x+5)$       $2x + 6 < 5x + 25$

       $-19 < 3x$              $\dfrac{-19}{3} < x$              **$x > \dfrac{-19}{3}$** $(-6.333)$

3.     $(2x-1)(2x-3) = 8$     $4x^2 - 8x + 3 = 8$       $4x^2 - 8x - 5 = 0$

       Solving on calculator                           **$x = -0.5$ or $2.5$**

4.     Let $h$ = height.        width = $h - 1$ and area = $h(h-1) = 1.44$

       $1.44 = h(h-1)$        $h^2 - h - 1.44 = 0$       $h = 1.8$ or $-0.8$

       Ignore negative height.   width = $h - 1$        **The door is 1.8 by 0.8 metres**

5.     $\log_x(9) - 3\log_x(3)$     $= \log_x(9) - 3\log_x(3^3)$   $= \log_x\left(\dfrac{9}{3^3}\right)$        $= \mathbf{\log_x\left(\dfrac{1}{3}\right)}$

6.     $\dfrac{2x^2 - 5x + 2}{x-2}$           $= \dfrac{(2x-1)(x-2)}{(x-2)}$        $= \dfrac{(2x-1)\cancel{(x-2)}}{\cancel{(x-2)}}$      $= \mathbf{2x - 1}$

7.     $4y = \dfrac{2x-1}{3}$              $3 \times 4y = 2x - 1$       $12y + 1 = 2x$

                                          **$x = 6y + \tfrac{1}{2}$ or $x = \dfrac{12y+1}{2}$**

8.     $(3^x)^3 = 3^{3x} = (3^3)^x = (27)^x = 27^x$

**(Q4 and Q8 are Merit)**