

## L2 Algebra Revision #1

1. Simplify:  $\left(\frac{\sqrt{e}}{f^{-2}}\right)^{0.5}$

2. Solve:  $\log_x(125) = 3$

3. Simplify:  $\frac{x+2}{3x^2+7x+2}$

4. The volume of a sphere is given by:  $V = \frac{4}{3} \pi r^3$

Write a formula that allows you to determine the increase in radius for an increase from one volume ( $V_1$ ) to another volume ( $V_2$ ).

Use your formula to find the increase in radius for an increase from  $25 \text{ cm}^3$  to  $40 \text{ cm}^3$ .

5. If  $\log_x(a) = 1.5$  and  $\log_x(b) = 6$ , what does  $\log_x\left(\frac{a}{b^2}\right) = ?$

6. Solve:  $2k \geq \frac{1+6k}{2}$

7. Solve:  $2p^2 + 15p = 8$

8. A cheeseburger costs 30 cents more than a hamburger and 20 cents less than a baconburger.

If an order of 3 cheeseburgers costs \$2.75 less than an order of 2 hamburgers and 2 baconburgers, how much does a cheeseburger cost?

## Answers: L2 Algebra Revision #1

1. Simplify:  $\left(\frac{\sqrt{e}}{f^{-2}}\right)^{0.5} = (e^{0.5}f^2)^{0.5} = (e^{0.5})^{0.5}(f^2)^{0.5} = e^{0.25}f$  or  $\sqrt[4]{e}f$

2.  $\log_x(125) = 3$       If  $y = b^x$  then  $\log_b y = x$        $125 = x^3$     $x = \sqrt[3]{125}$        **$x = 5$**

3.  $\frac{x+2}{3x^2+7x+2} = \frac{(x+2)}{(x+2)(3x+1)} = \frac{(x+2)}{(x+2)(3x+1)} = \frac{1}{3x+1}$

4.  $V = \frac{4}{3}\pi r^3$        $\frac{4V}{3\pi} = r^3$        $r = \sqrt[3]{\frac{4V}{3\pi}}$

$\Delta r = \sqrt[3]{\frac{4V_2}{3\pi}} - \sqrt[3]{\frac{4V_1}{3\pi}}$        $\Delta r = \sqrt[3]{\frac{4}{3\pi}} (\sqrt[3]{V_2} - \sqrt[3]{V_1})$

**$\Delta r = 0.7515 (\sqrt[3]{V_2} - \sqrt[3]{V_1})$**

$\Delta r = 0.7515 (\sqrt[3]{40} - \sqrt[3]{25}) = 0.3727$

**$\Rightarrow r$  increases by  $0.3727$  cm**

5. given  $\log_x(a) = 1.5$  and  $\log_x(b) = 6$

$\log_x\left(\frac{a}{b^2}\right) = \log_x(a) - 2\log_x(b) = 1.5 - 2 \times 6 = -10.5$

6. Solve:  $2k \geq \frac{1+6k}{2}$        $4k \geq 1+6k$        $-1 \geq 2k$        **$k \leq \frac{-1}{2}$  (-0.5)**

7.  $2p^2 + 15p = 8$        $2p^2 + 15p - 8 = 0$       calculator       **$p = 0.5$  or  $-8$**

8. Our equations are:  $c = h + 30$ ,  $c = b - 20$  and  $3c + 275 = 2h + 2b$

Rewriting the first two in terms of  $c$  gives:  $h = c - 30$  and  $b = c + 20$

Putting these into  $3c + 275 = 2h + 2b$  gives:  $3c + 275 = 2(c - 30) + 2(c + 20)$

Expanding this:  $3c + 275 = 2c - 60 + 2c + 40$        $295 = 1c$

**A cheeseburger costs \$2.95**

**(Q4 and Q8 are Merit)**