



f)  $x \times x \times y \times y \times y \times y \times z \times z \times z \times w = wx^2y^4z^3$

7. a) een miljoen drie honderd duizend =  $1.3 \times 10^6$

b) 2 870 000 000 000 =  $2.87 \times 10^{12}$

c) 36 020 000 =  $3.602 \times 10^7$

d) 58 996 =  $5.8996 \times 10^4$

e) 6 015 =  $6.015 \times 10^3$

f) 240 =  $2.4 \times 10^2$

8. a)  $2.376 \times 10^4 = 23\,760$

b)  $5.8 \times 10^7 = 58\,000\,000$

c)  $9.006 \times 10^8 = 900\,600\,000$

d)  $3.191 \times 10^0 = 3.191$

e)  $3.6 \times 10^2 = 360$

f)  $2.2345 \times 10^5 = 223\,450$

9. a)  $(7 - 3)^3 + 1$   
 $= (4)^3 + 1$   
 $= 64 + 1$   
 $= 65$

b)  $(3)(3)(3) + (2)^3$   
 $= 27 + 8$   
 $= 35$

c)  $(-4)^3 + (-4)^2$   
 $= -64 + 16$   
 $= -48$

d)  $5^4 \div 5^2$   
 $= 625 \div 25$   
 $= 25$

e)  $(2 \times 3)^2 + (9 \div 3)^3$   
 $= (6)^2 + (3)^3$   
 $= 36 + 27$   
 $= 63$

f)  $(-2)^2(-3) + 4^2$   
 $= (4)(-3) + 16$   
 $= -12 + 16$   
 $= 4$

10. a)  $x^m \times x^n = x^{m+n}$

b)  $x^m \div x^n = x^{m-n}$

c)  $(x^m)^n = x^{m \times n}$

d)  $(x^m \times y^n)^p = x^{m \times p} y^{n \times p}$

e)  $x^1 = x$

f)  $x^0 = 1$

11. a)  $a^2 \times a^3 \div a^4$   
 $= a^5 \div a^4$   
 $= a$

b)  $\frac{a^3b}{c^2} \times \frac{(ac)^2}{b^3}$   
 $= \frac{a^3b}{c^2} \times \frac{a^2c^2}{b^3}$   
 $= \frac{a^5bc^2}{b^3c^2}$   
 $= \frac{a^5}{b^2}$

$$\begin{aligned}
 \text{c)} \quad & \frac{a^2bc}{c^3d} \div \frac{a^2b^2}{(cd)^2} \\
 &= \frac{a^2b}{c^2d} \times \frac{c^2d^2}{a^2b^2} \\
 &= \frac{a^2bc^2d^2}{a^2b^2c^2d} \\
 &= \frac{d}{b}
 \end{aligned}$$

$$\begin{aligned}
 \text{d)} \quad & \frac{ef^4}{(gh)^0} \times \frac{(g^0h)^2}{e^3f} \\
 &= \frac{ef^4}{1} \times \frac{h^2}{e^3f} \\
 &= \frac{ef^4h^2}{e^3f} \\
 &= \frac{f^3h^2}{e^2}
 \end{aligned}$$

$$\begin{aligned}
 \text{e)} \quad & \frac{x^3y^2z^3}{(x^4y)^1} \times \frac{x^3y^4}{z^2} \div \frac{x^5y^5}{z^6} \\
 &= \frac{x^3y^2z^3}{x^4y} \times \frac{x^3y^4}{z^2} \times \frac{z^6}{x^5y^5} \\
 &= \frac{x^6y^6z^9}{x^9y^6z^2} \\
 &= \frac{z^7}{x^3}
 \end{aligned}$$

$$\begin{aligned}
 \text{f)} \quad & (x^2 + y^2)^0 \\
 &= 1
 \end{aligned}$$

$$\begin{aligned}
 12. \quad \text{a)} \quad & x^2 = 100 \\
 & x = \sqrt{100} \\
 & x = 10
 \end{aligned}$$

$$\begin{aligned}
 \text{b)} \quad & 9^x = 81 \\
 & 9^x = 9^2 \\
 & x = 2
 \end{aligned}$$

$$\begin{aligned}
 \text{c)} \quad & 11^2 = x \\
 & x = 121
 \end{aligned}$$

$$\begin{aligned}
 \text{d)} \quad & 36 = x^2 \\
 & x = \sqrt{36} \\
 & x = 6
 \end{aligned}$$

$$\begin{aligned}
 \text{e)} \quad & 7^x = 49 \\
 & 7^x = 7^2 \\
 & x = 2
 \end{aligned}$$

$$\begin{aligned}
 \text{f)} \quad & 29 = x^2 + 4 \\
 & x^2 = 25 \\
 & x = \sqrt{25} \\
 & x = 5
 \end{aligned}$$

$$\begin{aligned}
 \text{g)} \quad & 3^x + 2 = 29 \\
 & 3^x = 27 \\
 & 3^x = 3^3 \\
 & x = 3
 \end{aligned}$$

$$\begin{aligned}
 \text{h)} \quad & 6^3 = x \\
 & x = 216
 \end{aligned}$$

$$\begin{aligned}
 \text{i)} \quad & x = (3 + 4)^2 \\
 & x = 7^2 \\
 & x = 49
 \end{aligned}$$

$$\begin{aligned}
 \text{j)} \quad & (2 + x)^3 = 125 \\
 & 2 + x = \sqrt[3]{125} \\
 & x + 2 = 5 \\
 & x = 3
 \end{aligned}$$

13. a)	$\sqrt[3]{0.008}$ $= \sqrt[3]{\frac{8}{1000}}$ $= \frac{2}{10}$ $= 0.2 \text{ of } \frac{1}{5}$	b)	$\sqrt[3]{0.064}$ $= \sqrt[3]{\frac{64}{1000}}$ $= \frac{4}{10}$ $= 0.4 \text{ of } \frac{2}{5}$	c)	$\sqrt{0.36}$ $= \sqrt{\frac{36}{100}}$ $= \frac{6}{10}$ $= 0.6 \text{ of } \frac{3}{5}$
d)	$\sqrt{0.0016}$ $= \sqrt{\frac{16}{10000}}$ $= \frac{4}{100}$ $= 0.04 \text{ of } \frac{1}{25}$	e)	$\sqrt[3]{0.125}$ $= \sqrt[3]{\frac{125}{1000}}$ $= \frac{5}{10}$ $= 0.5 \text{ of } \frac{1}{2}$	f)	$\sqrt{0.49}$ $= \sqrt{\frac{49}{100}}$ $= \frac{7}{10}$ $= 0.7 \text{ of } \frac{7}{10}$
g)	$\sqrt{0.0064}$ $= \sqrt{\frac{64}{10000}}$ $= \frac{8}{100}$ $= 0.08 \text{ of } \frac{2}{25}$	h)	$\left(\frac{4}{10}\right)^2$ $= \frac{16}{100}$ $= 0.16 \text{ of } \frac{4}{25}$	i)	$\sqrt[3]{\frac{1}{8}}$ $= \frac{1}{2}$ $= 0.5 \text{ of } \frac{1}{2}$
j)	$\left(\frac{4}{5}\right)^3$ $= \frac{64}{125} \text{ of } 0.512$	k)	$\left(\frac{1}{3}\right)^3$ $= \frac{1}{27}$	l)	$\sqrt{\sqrt{16}}$ $= \sqrt{4}$ $= 2$

14. Boodskap:  $6 \times 7; 8^2 - 1; 7^2 + 2^2$        $2^2 + 1; 5.3 \times 10; 6^2 + 1; 9 \times 11; 2 \times 5^2 + 3; 7^2 - 7$   
 $6^2 + 6; 10^2 - 1; 8^2 - 11; 7^2 + 2; 3^2 - 2^2; 9^2 - 2^3; 9^2 + 4^2 + 2; 106 \div 2$        $9^2 + 10; 2^2 + 1$   
 $8^2 - 1; 4^3 + 3^3; 1^2; 100^0; 7^2 + 2^2; 5 \times 11$        $4^2 - 2; 8^2 - 3^2$   
 $3^2; 9 \times 10 + 1; 3^2 \times 11; 10^2 - 7^2; 12^2 - 102; 2 \times 3^3 - 1$   
 $10^2 - 3^2; \sqrt{25}; 2^3 \times 11; 11^2 - 70; 4^3 - \sqrt{81}; 10^2 - 99$   
 $= 42; 63; 53 \quad 5; 53; 37; 99; 53; 42 \quad 42; 99; 53; 51; 5; 73; 99; 53 \quad 91; 5$   
 $9; 91; 99; 51; 42; 53 \quad 91; 5; 88; 51; 55; 1$   
= THE SECRET TREASURE IS HIDDEN ON PIRATE ISLAND.

15. Eie oefening en mening – daar is baie verskillende maniere om by daardie getalle uit te kom. Moedig studente aan om aan meer komplekse maniere te dink om by die getal uit te kom en nie die maklikste manier waaraan hulle kan dink nie.