Indices

1 What is the value of:

a. $5^0 + 5^1 + 5^2$
b. $3^0 + 4^1 + 5^2$
c. $2^0 + 2^1 + 2^2$
d. $1^0 + 2^1 + 3^2$
e. $7^0 + 8^1 + 9^2$
f. $11^0 + 11^1 + 11^2$
g. $9^0 + 10^1 + 11^2$
h. $2^0 + 4^2 + 5^3$

2 Find the value of:

a. $12^0 \times 7 =$
b. $8^0 \times 3 =$
c. $7^0 \times 4 =$
d. $9^0 \times 11 =$
e. $14^0 \times 3 =$

3 Find the value of a and b where a, b >1

$$a^2 = b^3$$

4 Find the value of the following:

a. $m^3 \times m^2 \times m =$
b. $2m^3 \times 5m^2 \times m =$
c. $6m^3 \times m^2 \times 4m =$
d. $2m^7 \times 2m^5 \times 3m^3 =$
e. $m^5 \times m =$

5 Find the value of the following:

a. $\frac{x^5}{x^2} =$
b. $\frac{x^7}{x^5} =$
c. $\frac{x^{11}}{x^{-3}} =$
d. $\frac{x^{-6}}{x^4} =$
e. $\frac{x^{11}}{x^{13}} =$

6 Find the value of the following: Give your answer in index form.

a. $(5^2)^3$
b. $(3^3)^6$
c. $(4^4)^4$
d. $(6^5)^5$
e. $(3^2)^3$
f. $(2^5)^5$
g. $(-1^1)^2$
h. $(-2^2)^5$

i. $(3^4)^2$

7 $\frac{2^3\times2^7}{2^8} =$

8 Cancel down and then answer:

a. $\frac{2\times4\times8}{64\times16} =$

b. $\frac{16\times32\times128}{64\times256} =$

c. $\frac{2^4\times2^5\times2^7}{2^6\times2^8} =$

d. $\frac{(2^4)^3\times(2^5)^6\times2^7}{(2^6)^2\times(2^8)^3} =$

e. $\frac{(3^4)^3\times(3^5)^6\times3^7}{(3^6)^2\times(3^8)^3} =$

f. $\frac{512^2\times64^3\times256^5}{1024^3\times32^7} =$

9 Express the following as single powers

a. $\frac{x^3\times x^7\times x^4}{x^5}$ =

b. $x^{\frac{1}{2}} \times x^{\frac{3}{4}} =$

c. $\sqrt{x} \times x^{\frac{5}{2}}$ =

10 Find the value of x.

$$x^{\frac{3}{2}} = 8$$

$$x^{-\frac{1}{3}} = 10$$

$$4^x = 2^x + 56$$

11 $\left(3^{\frac{7}{2}} - 3^{\frac{1}{2}}\right)^2$

12 $x - \sqrt{x} - 6 = 0$ (Hint: This is a disguised quadratic)

13 Use binomial expansion for $(4x + \sqrt{3})^5$

14 $\frac{3}{\sqrt{x}} + \frac{2}{x} = 5$ (Hint: This is a quadratic equation as well)