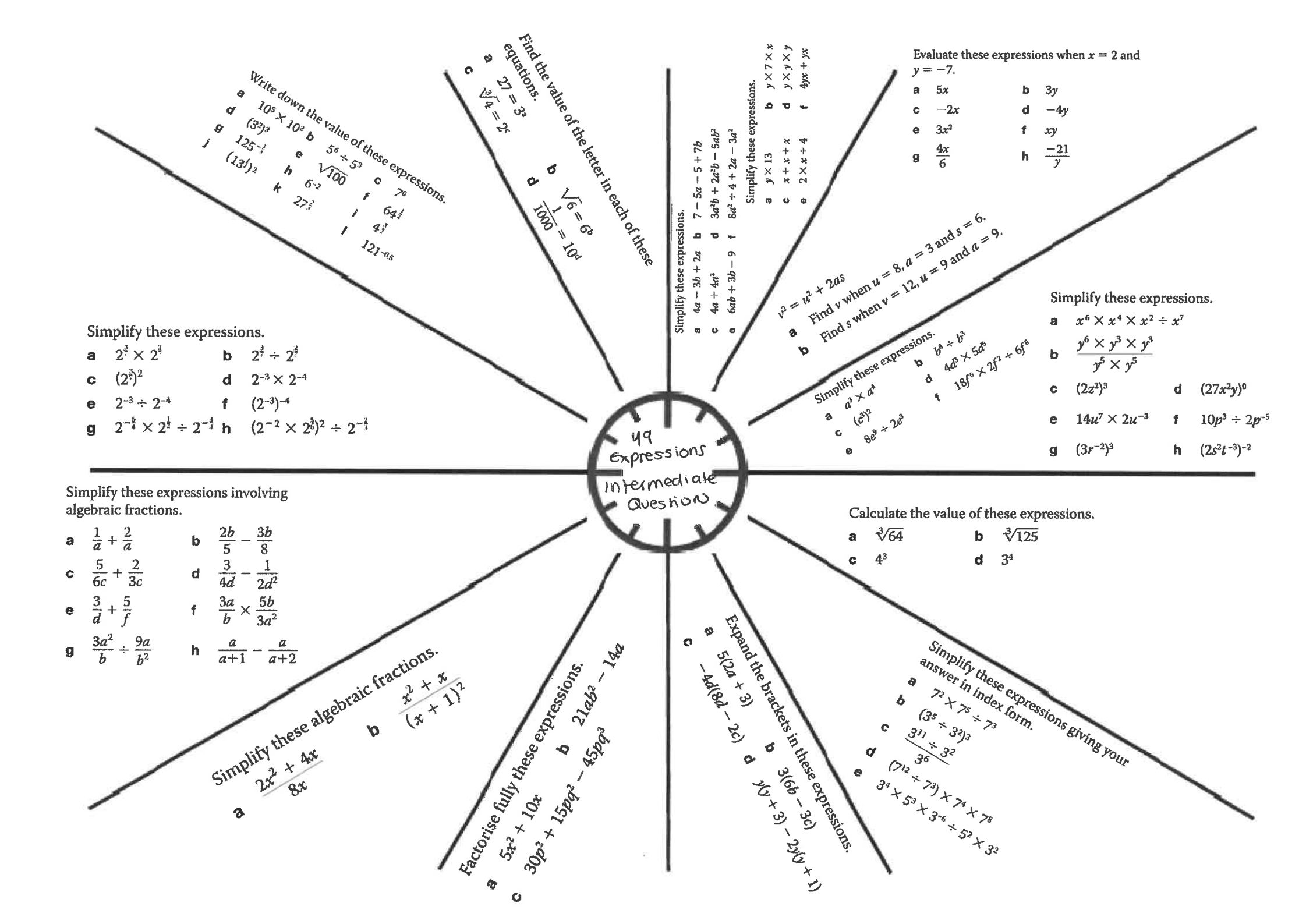
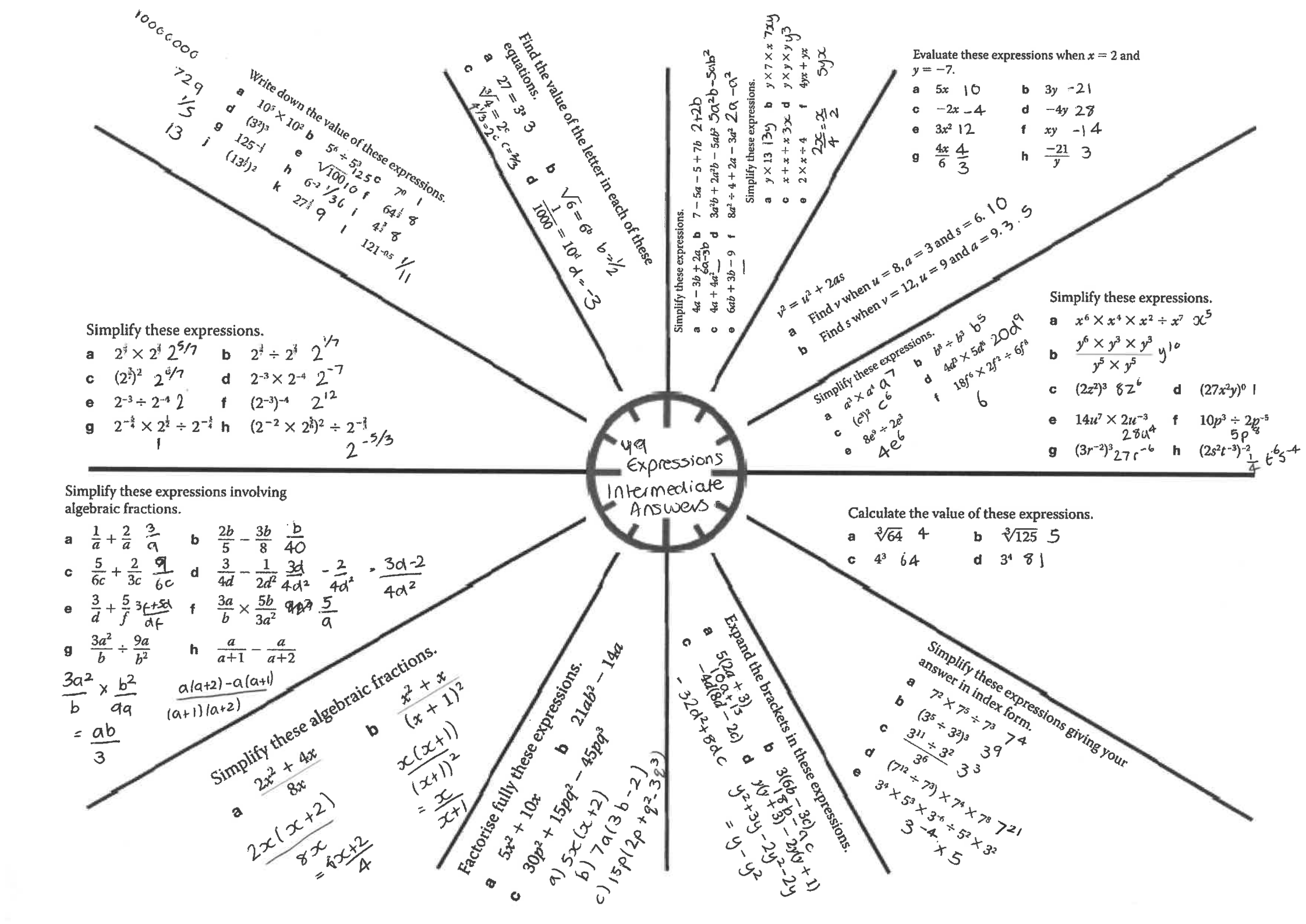

49 Expressions
Intermediate Question
Write down the value of these expressions.
a $10^5 \times 10^2$
b $5^6 \div 5^3$
c 7^0
d $(3^2)^3$
e $\sqrt{100}$
f $64^{\frac{1}{2}}$
g $125^{-\frac{1}{3}}$
h 6^{-2}
i $4^{\frac{3}{2}}$
j $(13^{\frac{1}{2}})^2$
k $27^{\frac{2}{3}}$
l $121^{-0.5}$
Find the value of the letter in each of these equations.
a $27 = 3^a$
b $\sqrt{6} = 6^b$
c $\sqrt[3]{4} = 2^c$
d $\frac{1}{1000} = 10^d$
Simplify these expressions.
a $4a - 3b + 2a$
b $7 - 5a - 5 + 7b$
c $4a + 4a^2$
d $3a^2b + 2a^2b - 5ab^2$
e $6ab + 3b - 9$
f $8a^2 \div 4 + 2a - 3a^2$
Simplify these expressions.
a $y \times 13$
b $y \times 7 \times x$
c $x + x + x$
d $y \times y \times y$
e $2 \times x \div 4$
f $4yx + yx$
Evaluate these expressions when $x = 2$ and $y = -7$.
a $5x$
b $3y$
c $-2x$
d $-4y$
e $3x^2$
f xy
g $\frac{4x}{6}$
h $\frac{-21}{y}$
$v^2 = u^2 + 2as$
a Find v when $u = 8$, $a = 3$ and $s = 6$.
b Find s when $v = 12$, $u = 9$ and $a = 9$.
Simplify these expressions.
a $a^3 \times a^4$
b $b^8 \div b^3$
c $(c^3)^2$
d $4d^5 \times 5d^5$
e $8e^9 \div 2e^3$
f $18f^6 \times 2f^2 \div 6f^8$
Simplify these expressions.
a $x^6 \times x^4 \times x^2 \div x^7$
b $\frac{y^6 \times y^3 \times y^3}{y^5 \times y^5}$
c $(2z^2)^3$
d $(27x^2y)^0$
e $14u^7 \times 2u^{-3}$
f $10p^3 \div 2p^{-5}$
g $(3r^{-2})^3$
h $(2s^2t^{-3})^{-2}$
Simplify these expressions.
a $2^{\frac{3}{2}} \times 2^{\frac{3}{2}}$
b $2^{\frac{3}{2}} \div 2^{\frac{3}{2}}$
c $(2^{\frac{3}{2}})^2$
d $2^{-3} \times 2^{-4}$
e $2^{-3} \div 2^{-4}$
f $(2^{-3})^{-4}$
g $2^{-\frac{5}{4}} \times 2^{\frac{1}{2}} \div 2^{-\frac{1}{4}}$
h $(2^{-2} \times 2^{\frac{3}{2}})^2 \div 2^{-\frac{1}{4}}$
Simplify these expressions involving algebraic fractions.
a $\frac{1}{a} + \frac{2}{a}$
b $\frac{2b}{5} - \frac{3b}{8}$
c $\frac{5}{6c} + \frac{2}{3c}$
d $\frac{3}{4d} - \frac{1}{2d^2}$
e $\frac{3}{d} + \frac{5}{f}$
f $\frac{3a}{b} \times \frac{5b}{3a^2}$
g $\frac{3a^2}{b} \div \frac{9a}{b^2}$
h $\frac{a}{a+1} - \frac{a}{a+2}$
Simplify these algebraic fractions.
a $\frac{2x^2 + 4x}{8x}$
b $\frac{x^2 + x}{(x+1)^2}$
Factorise fully these expressions.
a $5x^2 + 10x$
b $21ab^2 - 14a$
c $30p^2 + 15pq^2 - 45pq^3$
Expand the brackets in these expressions.
a $5(2a + 3)$
b $3(6b - 3c)$
c $-4d(8d - 2c)$
d $y(y + 3) - 2y(y + 1)$
Calculate the value of these expressions.
a $\sqrt[3]{64}$
b $\sqrt[3]{125}$
c 4^3
d 3^4
Simplify these expressions giving your answer in index form.
a $7^2 \times 7^5 \div 7^3$
b $(3^5 \div 3^2)^3$
c $\frac{3^{11} \div 3^2}{3^6}$
d $(7^{12} \div 7^3) \times 7^4 \times 7^8$
e $3^4 \times 5^3 \times 3^{-6} \div 5^2 \times 3^2$



Write down the value of these expressions.

a $10^5 \times 10^2$ b $5^6 \div 5^3$ 125 c 7^0 1

d $(3^2)^3$ e $\sqrt{100}$ 10 f $64^{\frac{1}{2}}$ 8

g $125^{-\frac{1}{3}}$ h 6^{-2} $\frac{1}{36}$ i $4^{\frac{3}{2}}$ 8

j $(13^{\frac{1}{2}})^2$ 13 k $27^{\frac{2}{3}}$ 9 l $121^{-0.5}$ $\frac{1}{11}$

Find the value of the letter in each of these equations.

a $27 = 3^a$ 3 b $\sqrt{6} = 6^b$ $b = \frac{1}{2}$

c $\frac{1}{4^{1/3}} = 2^c$ $c = \frac{2}{3}$ d $\frac{1}{1000} = 10^d$ $d = -3$

Simplify these expressions.

a $7 - 5a - 5 + 7b$ $2 + 2b$

b $4a - 3b + 2a - 5b$ $6a - 8b$

c $4a + 4a^2$ d $3a^2b + 2a^2b - 5ab^2 - 5ab^2$ $5a^2b - 5ab^2$

e $6ab + 3b - 9$ f $8a^2 \div 4 + 2a - 3a^2$ $2a - a^2$

Simplify these expressions.

a $y \times 13$ 13y b $y \times 7 \times x$ 7xy

c $x + x + x$ 3x d $y \times y \times y$ y^3

e $2 \times x \div 4$ f $4yx + yx$ 5yx

Evaluate these expressions when $x = 2$ and $y = -7$.

a $5x$ 10 b $3y$ -21

c $-2x$ -4 d $-4y$ 28

e $3x^2$ 12 f xy -14

g $\frac{4x}{6}$ $\frac{4}{3}$ h $\frac{-21}{y}$ 3

$v^2 = u^2 + 2as$

a Find v when $u = 8$, $a = 3$ and $s = 6$. 10

b Find s when $v = 12$, $u = 9$ and $a = 9.3$. 5

Simplify these expressions.

a $a^3 \times a^4$ a^7 b $b^8 \div b^3$ b^5

c $(c^3)^2$ c^6 d $4d^3 \times 5d^6$ $20d^9$

e $8e^9 \div 2e^3$ $4e^6$ f $18f^6 \times 2f^2 \div 6f^8$ 6

Simplify these expressions.

a $2^{\frac{5}{7}} \times 2^{\frac{4}{7}}$ $2^{5/7}$ b $2^{\frac{1}{3}} \div 2^{\frac{2}{3}}$ $2^{1/7}$

c $(2^{\frac{3}{7}})^2$ $2^{6/7}$ d $2^{-3} \times 2^{-4}$ 2^{-7}

e $2^{-3} \div 2^{-4}$ 2 f $(2^{-3})^{-4}$ 2^{12}

g $2^{-\frac{3}{4}} \times 2^{\frac{1}{2}} \div 2^{-\frac{3}{4}}$ 1 h $(2^{-2} \times 2^{\frac{3}{5}})^2 \div 2^{-\frac{3}{4}}$ $2^{-5/3}$

Simplify these expressions.

a $x^6 \times x^4 \times x^2 \div x^7$ x^5

b $\frac{y^6 \times y^3 \times y^3}{y^5 \times y^5}$ y^{10}

c $(2z^2)^3$ $8z^6$ d $(27x^2y)^0$ 1

e $14u^7 \times 2u^{-3}$ $28u^4$ f $10p^3 \div 2p^{-5}$ $5p^8$

g $(3r^{-2})^3$ $27r^{-6}$ h $(2s^2t^{-3})^{-2}$ $\frac{1}{4}t^6s^{-4}$

Simplify these expressions involving algebraic fractions.

a $\frac{1}{a} + \frac{2}{a}$ $\frac{3}{a}$ b $\frac{2b}{5} - \frac{3b}{8}$ $\frac{b}{40}$

c $\frac{5}{6c} + \frac{2}{3c}$ $\frac{9}{6c}$ d $\frac{3}{4d} - \frac{1}{2d^2}$ $\frac{3d}{4d^2} - \frac{2}{4d^2}$ $\frac{3d-2}{4d^2}$

e $\frac{3}{d} + \frac{5}{f}$ $\frac{3f+5d}{df}$ f $\frac{3a}{b} \times \frac{5b}{3a^2}$ $\frac{5}{a}$

g $\frac{3a^2}{b} \div \frac{9a}{b^2}$ $\frac{3a^2}{b} \times \frac{b^2}{9a}$ $= \frac{ab}{3}$ h $\frac{a}{a+1} - \frac{a}{a+2}$ $\frac{a(a+2) - a(a+1)}{(a+1)(a+2)}$

Simplify these algebraic fractions.

a $\frac{2x^2 + 4x}{8x}$ $\frac{2x(x+2)}{8x} = \frac{x+2}{4}$

b $\frac{x^2 + x}{(x+1)^2}$ $\frac{x(x+1)}{(x+1)^2} = \frac{x}{x+1}$

Factorise fully these expressions.

a $5x^2 + 10x$ b $21ab^2 - 14a$

c $30p^2 + 15pq^2 - 45pq^3$

a) $5x(x+2)$ b) $7a(3b-2)$

c) $15p(2p + q^2 - 3q^3)$

Expand the brackets in these expressions.

a $5(2a + 3)$ $10a + 15$ b $3(6b - 3c)$ $18b - 9c$

c $-4a(8d - 2c)$ $-32ad + 8ac$ d $y(y + 3) - 2y(y + 1)$ $y^2 + 3y - 2y^2 - 2y$ $= y - y^2$

Simplify these expressions giving your answer in index form.

a $7^2 \times 7^5 \div 7^3$ 7^4

b $(3^5 \div 3^2)^3$ 3^9

c $\frac{3^{11} \div 3^2}{3^6}$ 3^3

d $(7^{12} \div 7^3) \times 7^4 \times 7^8$ 7^{21}

e $3^4 \times 5^3 \times 3^{-6} \div 5^2 \times 3^2$ $3^{-4} \times 5$

Calculate the value of these expressions.

a $\sqrt[3]{64}$ 4 b $\sqrt[3]{125}$ 5

c 4^3 64 d 3^4 81