

A Algebra: Transposing equations

For the following make b the subject:

1 $b+2=a$

2 $3b=a$

3 $\frac{b+2}{c}=a$

4 $\frac{b-2}{c}=c$

5 $b(a+1)=d$

6 $s=b(a+1)$

7 $s=a(b-c)$

8 $\frac{a}{2}+b=c$

9 $\frac{3a}{2}-b=c$

10 $\frac{4b}{3}-2a=d$

11 $\frac{5b}{3}-2c=-e$

12 $\frac{b}{2}(a+2c)=-3$

B Algebra: Simultaneous equations

Solve these by substitution:

1 $y=2x$

2 $y=x+1$

3 $y=x-1$

$x+y=9$

$x+2y=8$

$y+x=-5$

4 $y=3x+1$

5 $y=4x-1$

$x+2y=9$

$x+y=19$

Solve these by elimination:

6 $x+y=4$

7 $x-y=3$

8 $x+2y=7$

$x-y=6$

$x+y=7$

$x-y=4$

9 $2x+y=5$

10 $y+3x=2$

$x+y=3$

$y+x=4$

C Indices: Dividing Index expressions

1 $a^5 \div a$

2 $a^2b^4 \div ab^2$

3 $3a^4b^4 \div ab^2$

4 $6a^4b \div 2ab$

5 $a^2b^3c \div 2ac^4$

6 $3a^4b^5 \div 6a^3b$

7 $a^{12}b^4 \div a^8c^9$

8 $4a^2b^3 \div 2ab^8$

9 $5a^2b \div 6ab^3$

10 $2a^3b^2 \div a^4c$

11 $16a^2b^4 \div 8ab^5$

12 $6ab^4 \div 4a^2b$

13 $6a^2b \div 2ab^2$

14 $7a^4b \div 8ab^3$

15 $5a^4c \div 3ac^2$

D Indices: Expanding brackets with Indices

1 $(2a^3)^2$

2 $(5a^2)^2$

3 $(6a^4)^2$

4 $(a^2b^3)^2$

5 $(3ab^4)^2$

6 $(2a^2b)^2$

7 $(3a^2bc^2)^3$

8 $(4ab^2c)^3$

9 $(3abc^2)^3$

10 $(5a^2b)^2$

11 $(-8ab^2)^2$

12 $(-3a^2b)^2$

13 $(-2a^2)^3$

14 $(-3a^3b)^3$

15 $(6a^2b^4)^2$

16 $\left(\frac{a^2b}{c}\right)^2$

17 $\left(\frac{a^2b}{3}\right)^2$

18 $\left(\frac{3b}{2a^2}\right)^2$

19 $\left(\frac{4a^2b}{c}\right)^2$

20 $\left(\frac{3a^4}{2b}\right)^3$

21 $\left(\frac{-4a^5}{5b^2}\right)^2$

E Indices: Prime factors

Evaluate:

1 $2^3 \times 3^2 \times 2$

2 $2^4 \times 3^3 \times 3$

3 $11^2 \times 7^2 \times 7^2$

4 $5^2 \times 2^3 \times 2^2$

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

6 $7^3 \times 3^2 \times 3^3$

7 $5^3 \times 5^2 \times 3 \times 3^2$

8 $7^2 \times 7 \times 3^2 \times 3$

9 $11^2 \times 2^3 \times 11$

10 $3^2 \times 3 \times 2^4 \times 2$

11 $5^3 \times 5^2 \times 2^3 \times 2$

12 $2^4 \times 2^3 \times 3 \times 3^4$

Worksheet 12

A 1 $b = a - 2$ 2 $b = \frac{a}{3}$ 3 $b = ac - 2$

4 $b = c^2 + 2$ 5 $b = \frac{d}{(a+1)}$ 6 $b = \frac{s}{(a+l)}$

7 $b = \frac{s}{a} + c$ 8 $b = c - \frac{a}{2}$ 9 $b = \frac{3a}{2} - c$

10 $b = \frac{3(2a+d)}{4}$ 11 $b = \frac{3}{5}(2c-e)$ 12 $b = \frac{-6}{a+2c}$

B 1 $x = 3$ 2 $x = 2$ 3 $x = -2$
 $y = 6$ $y = 3$ $y = -3$

4 $x = 1$ 5 $x = 4$ 6 $x = 5$
 $y = 4$ $y = 15$ $y = -1$

7 $x = 5$ 8 $x = 5$ 9 $x = 2$
 $y = 2$ $y = 1$ $y = 1$

10 $x = -1$
 $y = 5$

C 1 a^4 2 ab^2 3 $3a^3b^2$ 4 $3a^3$ 5 $\frac{ab^3}{2c^3}$

6 $\frac{ab^4}{2}$ 7 $\frac{a^4b^4}{c^9}$ 8 $\frac{2a}{b^5}$ 9 $\frac{5a}{6b^2}$ 10 $\frac{2b^2}{ac}$

11 $\frac{2a}{b}$ 12 $\frac{3b^3}{2a}$ 13 $\frac{3a}{b}$ 14 $\frac{7a^3}{8b^2}$ 15 $\frac{5a^3}{3c}$

D 1 $4a^6$ 2 $25a^4$ 3 $36a^8$
4 a^4b^6 5 $9a^2b^8$ 6 $4a^4b^2$
7 $27a^6b^3c^6$ 8 $64a^3b^6c^3$ 9 $27a^3b^3c^6$

10 $25a^4b^2$ 11 $64a^2b^4$ 12 $9a^4b^2$

13 $-8a^6$ 14 $-27a^9b^3$ 15 $36a^4b^8$

16 $\frac{a^4b^2}{c^2}$ 17 $\frac{a^4b^2}{9}$ 18 $\frac{9b^2}{4a^4}$

19 $\frac{16a^4b^2}{c^2}$ 20 $\frac{27a^{12}}{8b^3}$ 21 $\frac{16a^{10}}{25b^4}$

E 1 144 2 1296 3 290 521

4 800 5 21 952 6 83 349

7 84 375 8 9261 9 10 648

10 864 11 50 000 12 31 104