

## A Algebra: Expansion of brackets

1  $a(a+2b)$

2  $a(6-3b+c)$

3  $-a(2-4b-c)$

4  $5a(2a+\frac{3}{5}-4b)$

5  $-6a(\frac{2a}{3}+3b)$

6  $-4(\frac{a}{4}+2b-3)$

7  $(a+2)(a+1)$

8  $(a-2)(a+1)$

9  $(a+3)(a+4)$

10  $(a+2)(a+4)$

11  $(a-4)(a+2)$

12  $(a-6)(a-2)$

## B Algebra: Solving equations by removing two numbers

Solve the equation for  $a$ :

1  $2a-6=-18$

2  $3a+9=27$

3  $-2a+3=9$

4  $-3a-1=-10$

5  $-3a+1=16$

6  $\frac{3a}{7}=21$

7  $\frac{9a}{11}=-18$

8  $\frac{-2a}{3}=8$

9  $\frac{a-1}{3}=10$

10  $\frac{a+1}{4}=-3$

11  $\frac{-a+1}{2}=6$

12  $\frac{-2a+1}{3}=5$

## C Algebra: Solving quadratic equations

Solve the equations:

1  $a^2=100$

2  $b^2=16$

3  $a^2+11=60$

4  $3a^2=192$

5  $\frac{b^2}{4}=4$

6  $(a+1)(a+2)=0$

7  $(a-1)(a+3)=0$

8  $(a+2)(a-3)=0$

9  $(a-6)(a+2)=0$

10  $(a+1)(a-5)=0$

11  $a^2+5a+6=0$

12  $a^2-2a-8=0$

13  $a^2-3a+2=0$

14  $a^2-a-12=0$

15  $a^2+a-12=0$

## D Indices: Negative Indices

Express the following with positive indices:

1  $x^{-1}$

2  $y^{-2}$

3  $ab^{-1}$

4  $a^{-1}b^{-1}$

5  $3ab^{-2}$

6  $4a^2b^{-3}$

7  $5a^2b^{-2}$

8  $6a^{-4}b$

9  $3a^{-2}b^{-4}$

10  $2^{-3}ab$

11  $3^{-2}a$

12  $3^{-1}c$

13  $4^{-1}a^{-1}$

14  $5^{-1}a^{-2}$

15  $(2a)^{-1}$

16  $(5b)^{-1}$

17  $(9a^2)^{-1}$

18  $2a^{-3}$

19  $7a^{-2}c$

20  $8a^{-2}c^{-3}$

## E Indices: Fractional Indices

Evaluate:

1  $49^{\frac{1}{2}}$

2  $64^{\frac{1}{2}}$

3  $3 \times 100^{\frac{1}{2}}$

4  $\frac{9^{\frac{1}{2}}}{3}$

5  $8^{\frac{1}{3}}$

6  $15+25^{\frac{1}{2}}$

7  $2\left(16^{\frac{1}{2}}-3\right)$

8  $27^{\frac{1}{3}} \times 5$

9  $64^{\frac{1}{3}}+8$

10  $1^{\frac{1}{2}}+1^{\frac{1}{3}}$

11  $\frac{9^{\frac{1}{2}}+8}{2}$

12  $\frac{25^{\frac{1}{2}} \times 2}{8^{\frac{1}{3}}}$

## Worksheet 10

- A**
- |    |                  |    |                     |
|----|------------------|----|---------------------|
| 1  | $a^2 + 2ab$      | 2  | $6a - 3ab + ac$     |
| 3  | $-2a + 4ab + ac$ | 4  | $10a^2 + 3a - 20ab$ |
| 5  | $-4a^2 - 18ab$   | 6  | $-a - 8b + 12$      |
| 7  | $a^2 + 3a + 2$   | 8  | $a^2 - a - 2$       |
| 9  | $a^2 + 7a + 12$  | 10 | $a^2 + 6a + 8$      |
| 11 | $a^2 - 2a - 8$   | 12 | $a^2 - 8a + 12$     |
- B**
- |    |     |    |     |   |     |   |    |    |     |
|----|-----|----|-----|---|-----|---|----|----|-----|
| 1  | -6  | 2  | 6   | 3 | -3  | 4 | 3  | 5  | -5  |
| 6  | 49  | 7  | -22 | 8 | -12 | 9 | 31 | 10 | -13 |
| 11 | -11 | 12 | -7  |   |     |   |    |    |     |
- C**
- |    |          |    |         |    |         |    |         |
|----|----------|----|---------|----|---------|----|---------|
| 1  | $\pm 10$ | 2  | $\pm 4$ | 3  | $\pm 7$ | 4  | $\pm 8$ |
| 5  | $\pm 4$  | 6  | -1, -2  | 7  | 1, -3   | 8  | 3, -2   |
| 9  | 6, -2    | 10 | 5, -1   | 11 | -3, -2  | 12 | 4, -2   |
| 13 | 1, 2     | 14 | 4, -3   | 15 | 3, -4   |    |         |
- D**
- |    |                    |    |                    |    |                  |    |                    |    |                    |
|----|--------------------|----|--------------------|----|------------------|----|--------------------|----|--------------------|
| 1  | $\frac{1}{x}$      | 2  | $\frac{1}{y^2}$    | 3  | $\frac{a}{b}$    | 4  | $\frac{1}{ab}$     | 5  | $\frac{3a}{b^2}$   |
| 6  | $\frac{4a^2}{b^3}$ | 7  | $\frac{5a^2}{b^2}$ | 8  | $\frac{6b}{a^4}$ | 9  | $\frac{3}{a^2b^4}$ | 10 | $\frac{ab}{8}$     |
| 11 | $\frac{a}{9}$      | 12 | $\frac{c}{3}$      | 13 | $\frac{1}{4a}$   | 14 | $\frac{1}{5a^2}$   | 15 | $\frac{1}{2a}$     |
| 16 | $\frac{1}{5b}$     | 17 | $\frac{1}{9a^2}$   | 18 | $\frac{2}{a^3}$  | 19 | $\frac{7c}{a^2}$   | 20 | $\frac{8}{a^2c^3}$ |
- E**
- |    |                |    |   |   |    |   |    |    |   |
|----|----------------|----|---|---|----|---|----|----|---|
| 1  | 7              | 2  | 8 | 3 | 30 | 4 | 1  | 5  | 2 |
| 6  | 20             | 7  | 2 | 8 | 15 | 9 | 12 | 10 | 2 |
| 11 | $5\frac{1}{2}$ | 12 | 5 |   |    |   |    |    |   |