A Algebra: Algebraic fractions

Skill 3.3

Simplify the following:

1 $\dfrac{2a}{3} \times \dfrac{4b}{5}$ 2 $\dfrac{9a}{2b} \times \dfrac{3b}{9c}$ 3 $\dfrac{2ab}{7} \times \dfrac{3c}{8}$ 4 $\dfrac{9a}{5} \div \dfrac{2a}{7}$

5 $\dfrac{8ab}{7} \div \dfrac{16a}{3}$ 6 $\dfrac{4b}{21} \div \dfrac{3b}{2} \times \dfrac{5a}{2b}$ 7 $\dfrac{6}{7} + \dfrac{9a}{4}$ 8 $\dfrac{3b}{2} + \dfrac{2b}{a}$

9 $\dfrac{4}{a} - \dfrac{6}{b}$ 10 $\dfrac{(a-3)}{2} + \dfrac{2}{a}$ 11 $\dfrac{(a+3)}{2} - \dfrac{6}{b}$ 12 $\dfrac{6ab}{4} - \dfrac{(a+1)}{b}$

B Indices: Working with numbers expressed in scientific notation

Skill 4.9

Calculate the following:

1 $7 \times 10^6 \times 3 \times 10^8$ 2 $9 \times 10^5 \times 7 \times 10^{11}$ 3 $1.3 \times 10^2 \times 2 \times 10^8$

4 $2.06 \times 10^4 \times 3.2 \times 10^9$ 5 $1.076 \times 10^9 \times 3 \times 10^{12}$ 6 $6 \times 10^{14} \div 3 \times 10^8$

7 $8 \times 10^{10} \div 4 \times 10^4$ 8 $8 \times 10^3 \div 4 \times 10^{-3}$ 9 $8.4 \times 10^8 \div 2 \times 10^{-4}$

10 $6.6 \times 10^{10} \div 6 \times 10^{-2}$

C Indices: Multiplying index expressions

Skill 4.2

Simplify:

1 $a^7 \times a^4 \times a^3$ 2 $a^9 \times a^{10} \times a^{12}$ 3 $5a^2 \times 4a^4$

4 $-4a^2b \times 5ab^2$ 5 $9a^2b \times 27ab^4$ 6 $6a^3b^2 \times -4ab^2$

7 $2^3a^4b \times 2^2a^4b^3$ 8 $3^2ab^4 \times 3^3ab^5$ 9 $-6a^4b^3 \times 2ab^4$

10 $3^4a^2b^4 \times 3ab^3$ 11 $6a^4b^3 \times 2^3ab^2$ 12 $-17a^2b^3 \times -4ab^4c^8$

D Cartesian plane: Finding the equation of a straight line

Skill 5.4

Find the equations of these lines:
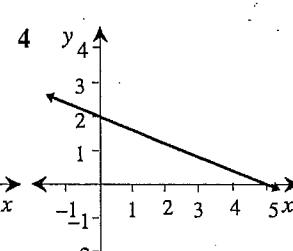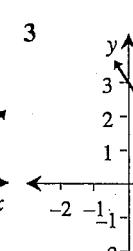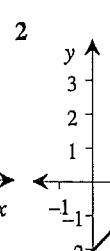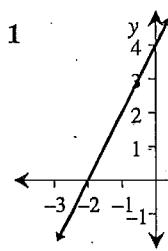
E Cartesian plane: Simultaneous equations

Skill 5.5

Solve these simultaneous equations using algebraic techniques and sketch each pair on the same set of axes to check where they cross:

1 $y = 2x + 4$ 2 $x + y = 4$
   $y = x + 6$ $x - y = 2$

Worksheet 13

A 1 $\dfrac{8ab}{15}$ 2 $\dfrac{3a}{2c}$ 3 $\dfrac{3abc}{28}$

4 $\dfrac{63}{10} = 6\dfrac{3}{10}$ 5 $\dfrac{3b}{14}$ 6 $\dfrac{20a}{63b}$

7 $\dfrac{24+63a}{28}$ 8 $\dfrac{3ab+4b}{2a}$ 9 $\dfrac{4b-6a}{ab}$

10 $\dfrac{a^2-3a+4}{2a}$ 11 $\dfrac{ab+3b-24}{4b}$ 12 $\dfrac{6ab^2-4a-4}{4b}$

B 1 2.1×10^{15} 2 6.3×10^{17} 3 2.6×10^{10}

4 6.592×10^{13} 5 3.228×10^{21} 6 2×10^6

7 2×10^6 8 2×10^6 9 4.2×10^{12}

10 1.1×10^{12}

C 1 a^{14} 2 a^{31} 3 $20a^6$

4 $-20a^3b^3$ 5 $243a^3b^5$ 6 $-24a^4b^4$

7 $32a^8b^4$ 8 $81a^2b^9$ 9 $-12a^5b^7$

10 $243a^3b^7$ 11 $48a^5b^5$ 12 $68a^3b^7c^8$

D 1 $y = 2x + 4$ 2 $y = x - 2$ 3 $y = -\dfrac{3x}{2} + 3$

4 $y = -\dfrac{2x}{5} + 2$

E 1 $x = 2$ 2 $x = 3$
   $y = 8$ $y = 1$