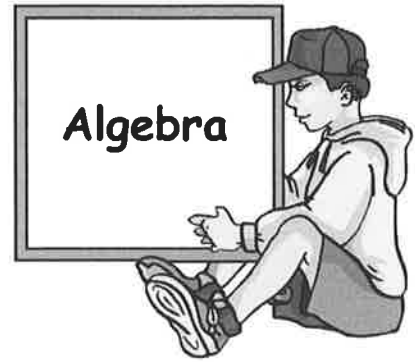


CHAPTER 7

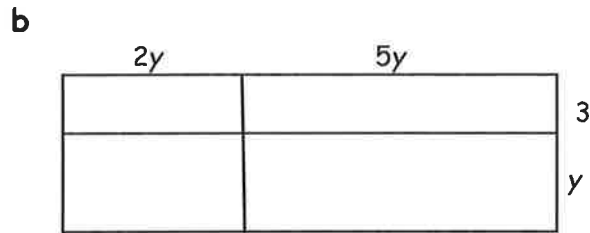
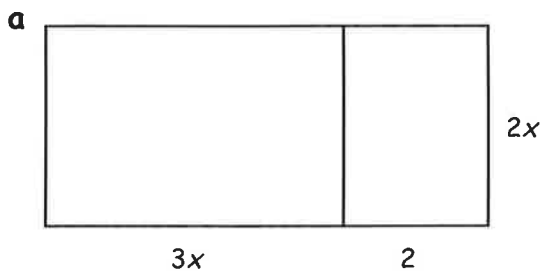


Exercise 1 Simplifying

1. Simplify each expression by collecting like terms :-

- | | | | | | | | |
|---|---------------|---|----------------|---|-------------------------|---|---------------------------|
| a | $y + y + y$ | b | $t + 3t - 2t$ | c | $3p + 5p + p$ | d | $4k + 9k - 4k$ |
| e | $2w + 6w + 3$ | f | $7u + 3 - 6u$ | g | $8y + 4b + 3y - 2b + 7$ | | |
| h | $3 \times 4y$ | i | $6k \times 7$ | j | $16p \div 2$ | k | $24w \div 8$ |
| l | $a \times 3b$ | m | $2v \times 3v$ | n | $2ab \times 3a$ | o | $3cd \times 4c \times 2d$ |
| p | $18p \div 3p$ | q | $6k^2 \div 3k$ | r | $40g^2 \div 8g^2$ | s | $4t \times 6t \div 8t$ |

2. Find the total area of each large rectangle in terms of x and y :-



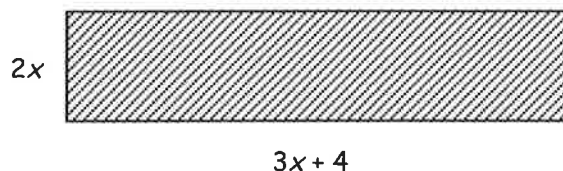
Exercise 2 Breaking Brackets

1. Multiply out each bracket :-

- | | | | | | | | |
|---|-------------|---|--------------|---|---------------|---|---------------|
| a | $3(x + 4)$ | b | $7(y - 3)$ | c | $5(2k + 5)$ | d | $11(6y - 7)$ |
| e | $y(y + 2)$ | f | $k(k - 3)$ | g | $u(3u + 4)$ | h | $3r(3r - 4)$ |
| i | $-3(q + 5)$ | j | $-4(2t + 6)$ | k | $-5(j - 2)$ | l | $-2(3f - 8)$ |
| m | $-y(y + 7)$ | n | $-h(h - 3)$ | o | $-2w(2w + 1)$ | p | $-5k(3 - 4k)$ |

2. Write down the **area** and **perimeter** of this rectangle :-

- a using brackets
b without brackets.



Exercise 3**Breaking Brackets and Simplifying**

1. Multiply out the brackets and simplify fully where necessary :-

a $5(k+2)+3$

b $8(2y+4)-12$

c $7(3e-2)+11$

d $8+2(t+3)$

e $11-3(3+w)$

f $15-(g+15)$

g $3(w-1)+2(w+1)$

h $4(2y-3)+5(4y+3)$

i $2(4r+3)-6$

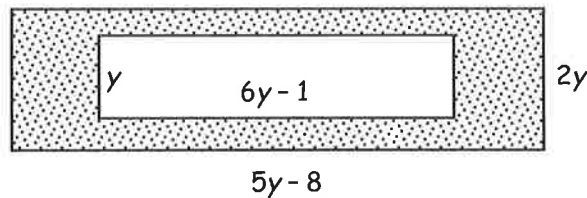
j $3w-(w+4)+2(2-w)$

k $4(3y+4)-2(5y-1)-18$

l $3p+2(4p-6)-(9p+12)$

m $5(3-2m)+3(2m-6)-4(1-8m)+2m+7.$

2. Calculate the shaded area of the rectangle shown, in terms of y .

**Exercise 4****Solving Basic Equations**

1. Solve each of the following :-

a $y+5=7$

b $t-3=6$

c $5+h=11$

d $w+31=30$

e $15+k=13$

f $121-s=123$

g $3x=12$

h $5g=-15$

i $3u=1$

j $\frac{1}{2}d=40$

k $\frac{1}{3}r=4$

l $\frac{4}{5}w=16.$

2. Solve (show all your working) :-

a $2x+1=13$

b $3w-1=20$

c $5y-11=19$

d $5x+1=21$

e $17q-17=17$

f $12d+12=0$

g $6k-4=17$

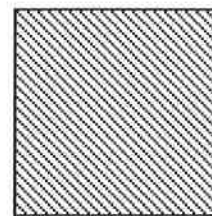
h $11t+10=76$

i $\frac{1}{4}g-1=11.$

3. The perimeter of a square is found to be $3x-7$ cm.

When measured the perimeter is 17 cm.

Find the value of x .



Perimeter = $3x-7$

Exercise 5**Solving Equations with Brackets**

1. Solve each of the following :-

a $3(y + 5) = 18$

b $5(t - 3) = 35$

c $2(5 + h) = 14$

d $3(w + 1) = 33$

e $4(5 + k) = 36$

f $6(11 - s) = 60$

g $3(x + 1) = 12$

h $5(g + 2) = -15$

i $3(u - 11) = -18$

j $(2d + 4) + d + 1 = 11$

k $4(r - 2) + 2(r + 1) = 12$

l $3(2w + 2) - (w + 6) = 10$

m $2(2f + 3) + 3(4f - 1) - 2(5f + 3) = 0.$

2. Mixture :-

Solve (show all your working) :-

a $x + 6 = 11$

b $3w - 2 = 13$

c $\frac{1}{2}v - 1 = 13$

d $\frac{3}{4}f + 3 = 24$

e $4(2x - 1) = 4$

f $2(3e + 7) - 3 = 5.$

Exercise 6**Evaluating Expressions and Formulae**

1. Given $a = 2$, find :-

a $a + 6$

b $2a$

c $5a - 3$

d $(7a + 4) \div 2$

e $4(a + 2)$

f $6(11 - a) - 53$

g $3(a + 1) - 12$

h $5(a + 2) + 15$

i $3(a - 11) + 27.$

2. Given $b = 3$, $c = 5$ and $d = -1$, evaluate :-

a $b + c + d$

b $2b - c - 3d$

c $\frac{1}{2}(bc + d)$

d $3bcd$

e $cdb - dbc$

f $0.5(bd - cd).$

3. a If $f = 2$, $g = 4$ and $h = -2$, find e , given $f + g + h + e = 10$.

b If $p = 3$, $r = -3$ and $s = 2$, find t given $st - prs = 12$.

4. If $m = 4$ and $n = 6$, find the values of :-

a m^2

b n^2

c \sqrt{m}

d $m^2 + n^2$

e $2m^2$

f $3mn^2$

g $\sqrt{mn + 1}$

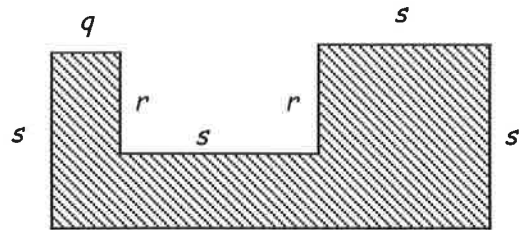
h $\sqrt{5m - 2n + 1}$

i $\sqrt{m^2 + n^2 - 3}.$

Exercise 7 Constructing & Evaluating Formulae

- A truck weighs y tonnes. The truck can carry x tonnes when fully loaded.
 - Write a formula for T , the weight of the truck and a maximum load.
 - Find T when $y = 4$ and $x = 1.5$.
 - Find y when $T = 6.25$ and $x = 2.1$.

- Write down a formula for the perimeter, P , in terms of q , r and s .
 - Find P given $q = 2$, $r = 4$ and $s = 7$.
 - Find q given $P = 132$, $r = 12$ and $s = 15$.



- (Difficult). Find the area of the shape in Qu 2, given that $s = 3$, $r = 2$ and $q = 1$.

Revisit - Review - Revise Exercise 7

- Simplify fully :-

a	$t + t + t$	b	$p \times p \times p$	c	$3k + 5p + 4k$	d	$4d + 9d - 7d$
e	$2w \times 6w$	f	$7u + 1 - 6u - 1$	g	$7a + 2b + 4 - b + 7$		
h	$5 \times 2y$	i	$6k^2 \times k$	j	$12p \div 2$	k	$12w^2 \div 4w$

- Given $a = 3$, $b = 4$ and $c = -1$, evaluate :-

a	$3a - 2b$	b	$2abc - 5c$	c	$\sqrt{2a + b + c}$	d	$8a^2 \div 4bc$
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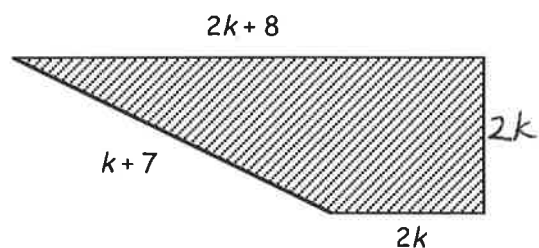
- Multiply out the brackets and simplify :-

a	$3(2b - 2) + 4$	b	$-3(5c - 6) - 9$	c	$5 + 2(g + 2)$	d	$8 - 5(2w - 3) + 7$
e	$4(2r + 3) + 3(4r - 8)$	f	$7(h - 2) - 2(3h - 6) - (h + 1) + 3$				

- A shape is made from a right angled triangle and a square as shown.

Find (in terms of k) the :-

- perimeter
- area of this shape.



5. Find the value of each of the following capital letters :-

a $P = 2t + 7w$, given $t = 12$ and $w = -2$

b $G = \frac{2wr}{k}$, given $w = 10$, $r = -3$ and $k = -4$

c $C = \sqrt{a^2 + b^2}$, given $a = 3$ and $b = 4$.

6. The cost of hiring gym equipment is given by the formula $C = D + 7d$, where C is cost in £'s, D is the deposit in £'s and d is the number of days.

How much would it cost to hire the equipment for 8 days with a deposit of £10 ?



7. a Write down the formula for the volume of a cuboid.
b Find the volume of a cuboid with length 10 cm, breadth 6 cm and height 5 cm.

Cumulative Ex 2



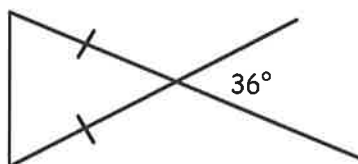
1. Find :-
- | | | | | | |
|---|-------------------------|---|------------------|---|----------------------|
| a | 125×6 | b | $8760 \div 4$ | c | 40% of 750 kg |
| d | $\frac{4}{5}$ of 9500 m | e | 0.86×70 | f | $4.3 + 6.4 \times 3$ |
| g | $(-5) + (-3)$ | h | $6 - (-6)$ | i | $-4 - (-5)$. |

2. Express each percentage as a fraction in its simplest form where possible :-

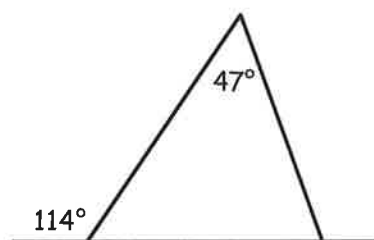
- | | | | | | | | |
|---|-----|---|-----|---|-----|---|--------|
| a | 75% | b | 34% | c | 84% | d | 12.5%. |
|---|-----|---|-----|---|-----|---|--------|

3. Copy each of the diagrams below and fill in the missing angles :-

a



b



4. a Plot these on a Cartesian coordinate diagram :- $A(4, 3)$, $B(-3, 1)$ and $C(4, -2)$.
b Given that A , B , C and D form the vertices (corners) of a parallelogram, give **three** possible answers for D .