Match the corresponding terms:

2n 2xn

$\frac{n}{2}$ $n \div 2$

2 + n add 2 onto n

$2n^2$ 2 xn xn

n-2 **subtract 2 from n**

2 - n **take n from 2**

Substitution

If a=5 work out:

~~$3a^2$~~

3a= $3 \times 5 = 15$ 5a-3= $25 - 3 = 22$

10-2a= $10 - 10 = 0$ $a^2 = 5 \times 5$ a^3

$\frac{a}{2} = 5 \div 2 = 2\frac{1}{2}$ $= 25$

page 136 A1-A6

$a = 4$

a) $n + 2 = 4 + 2 = 6$

b) $n + 5 = 4 + 5 = 9$

Order of operations

$(4+5) - (3 \times 5)$

$5 + 3 \times 2 = 5 + 6 = 11$ $\quad 9 - 15 = -6$

$\frac{8}{2} + 1 = 5$

$4 \times 2 - 5$

$\frac{4+8}{3}$

$8 - 2 \times 3 = 8 - 6 = 2$ $\quad = 2 \times 9 = 18$

$22 - 5 \times 2$

2×3^2

$4 \times (2 + 5)$

B rackets

I ndices (powers)

D ivision

M ultiplication

A ddition

S ubtraction

$(6+3) \times 2$

$= 9 \times 2$

$= 18$

Page 137 B1 to B6
First and last column only

4 x 2 + 5 13

4 +2 x 5 14

2 + 4 x 5 22

Harder Substitution

If a=2 evaluate, showing your working:

$3a + 8 = 3 \times 2 + 8$
$= 6 + 8$
$= 14$

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

$10 - 2a = 10 - 4$
$= 6$

$5a - 3 = 5 \times 2 - 3$
$= 10 - 3$
$= 7$

$\frac{a+4}{2} = \frac{2+4}{2} = \frac{6}{2} = 3$

$2(a+3) = 2 \times (2+3)$
$= 2 \times 5 = 10$

Page 138

Let a= 2 and b=3. Work out:

5a + b =

5a + 3b=

ab=

9a - 3b=

$3a_2$ =

$2a_2$ + 5a =

1

18

19

12

13 6

12

9

Worksheet

Formulas

Pocket money = 10p x age

$P = 10a$

$a = 6 \quad P = 10 \times 6 = 60p$

$a = 9 \quad P = 10 \times 9 = 90p$

Pocket money = 10 x a + 100

$P = 10a + 100$

$a = 13 \quad P = 10 \times 13 + 100$

$= 130 + 100 = 230 = £2.30$

Paper round:

Wage = 15p x each paper delivered

$W = 15 \times e$

$e = 100 \quad W = 15 \times 100 = 1500p$

$= £15.00$

Page 140

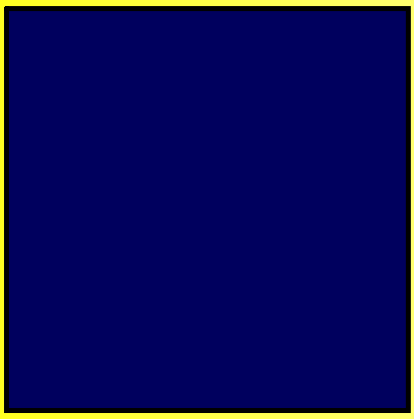
Formulas without words

C= 3 d

$C = 3 \times 6$

$= 18$

Find C if d = 6



P=4 x s

S= 10cm

P = 4 x 10 = 40cm

page 142

A = B - 4

a) A = 14 - 4 = 10

b) A = 18 - 4 = 14

Simplifying expressions

a+a+a= 3a

b+b= 2b

cxc= c^2

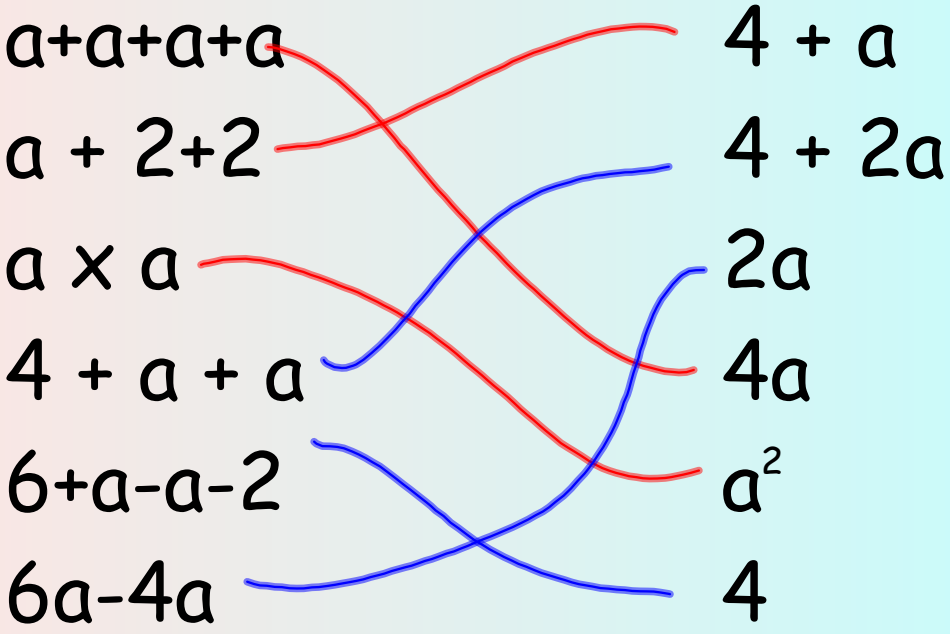
c + c = 2c

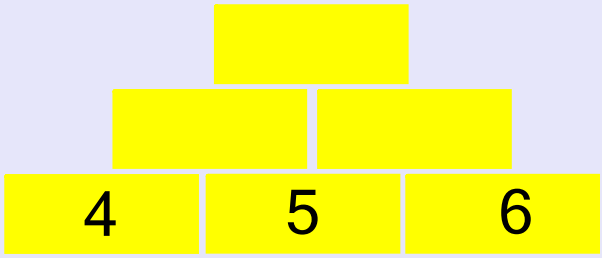
cxcxc= c^3

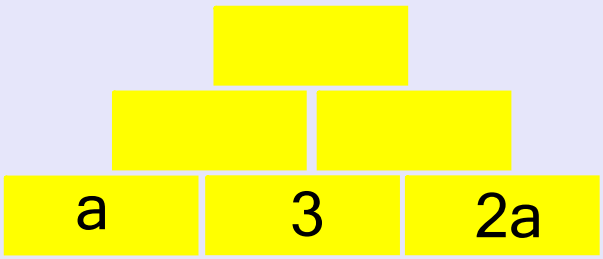
c + c + c = 3c

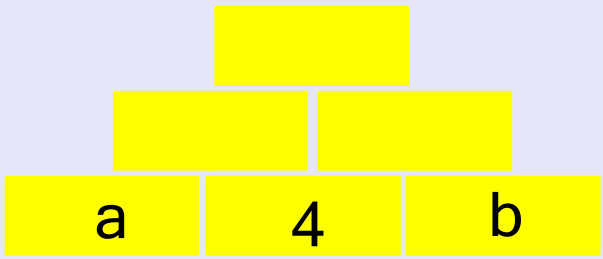
a+b-a= b

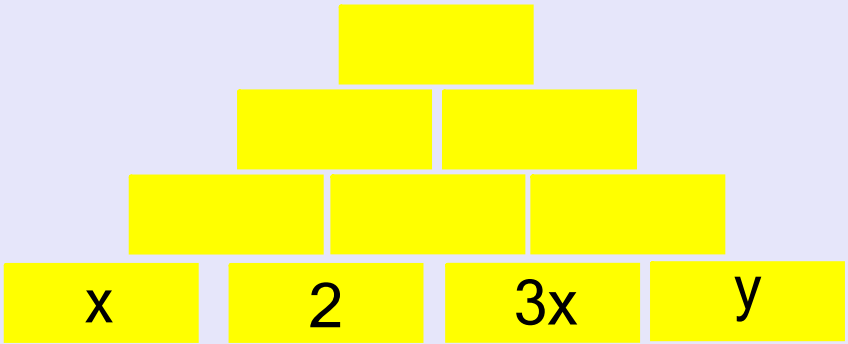
Match the expression to its partner.

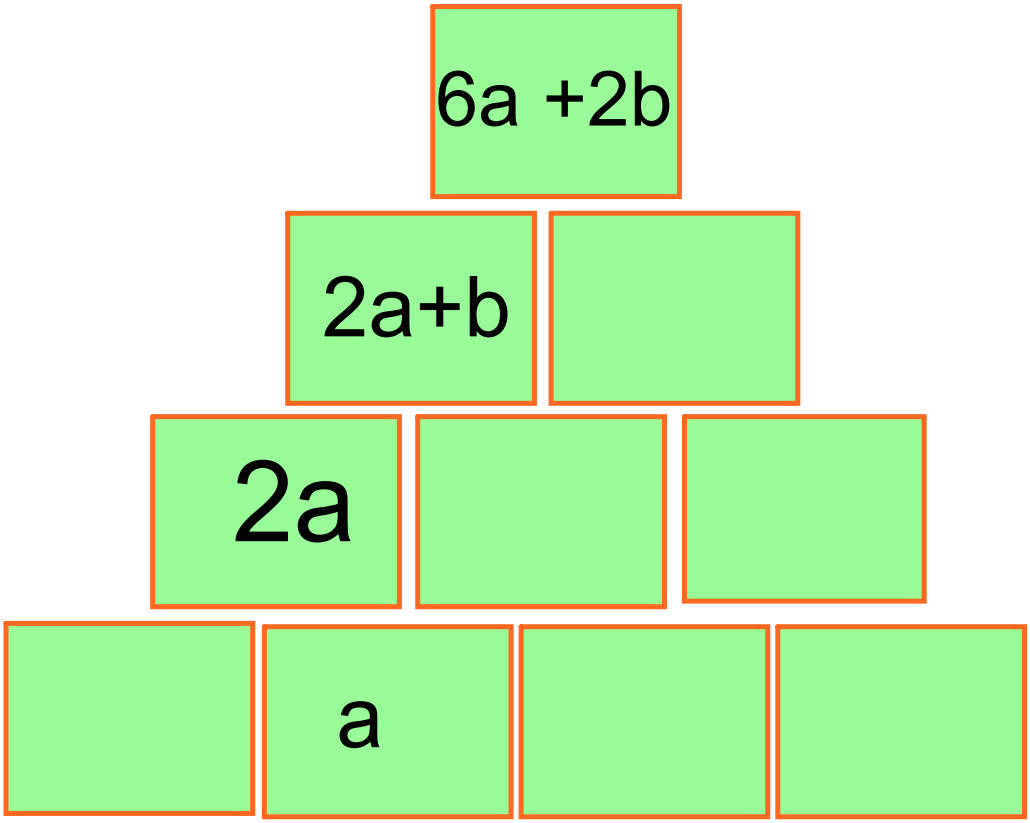



4
5
6


a
3
2a


a
4
b


x
2
3x
y


6a +2b
2a+b
2a
a

Let a= 2 and b=3. Work out:

5a + b = 9

5a + 3b= 13

ab= 6

9a - 3b= 12

$3a^2$ = 18

$2a^2$+ 5a = 12

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Worksheet

Multiplying

5 x 73

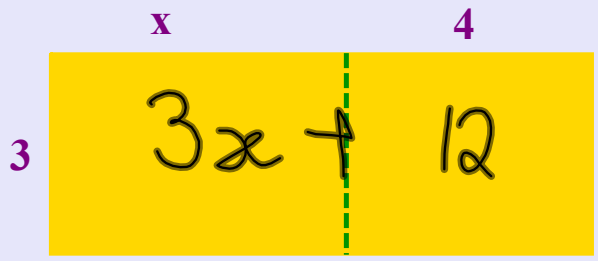
x	70	3
5	350	+ 15

= 365

7 x 36

x	30	6
7	210	+ 42 = 252

Multiplying out a bracket



$3(x+4)$

$=3x+12$

$5(y+3)$

$=5y+15$

×	x	$+6$
4	$4x$	$+24$

4(x + 6) =

$= 4x+24$

5 (y + 4) =

$=5y+20$

×	y	$+4$
5	$5y$	$+20$

10 (5+b)=

$= 50+10b$

×	5	$+b$
10	50	$+10b$

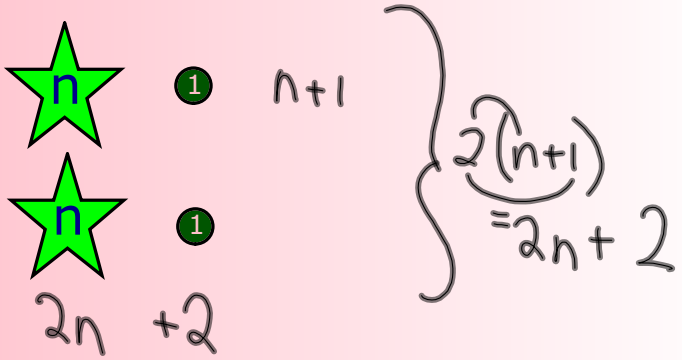
7 (x - 3)= $7x-21$

6 (a - 8)=

2 (10 - b)=

5 (2a + 5)=

7 (3b - 1)=



Multiplying out a bracket

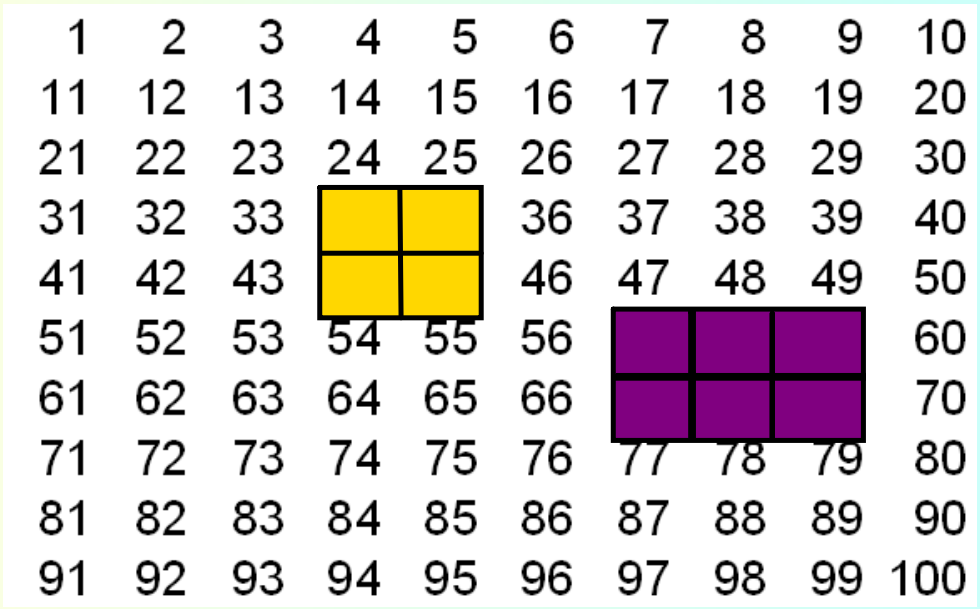
$3(n+4) = 3n+12$

$5(2-n) = 10-5n$

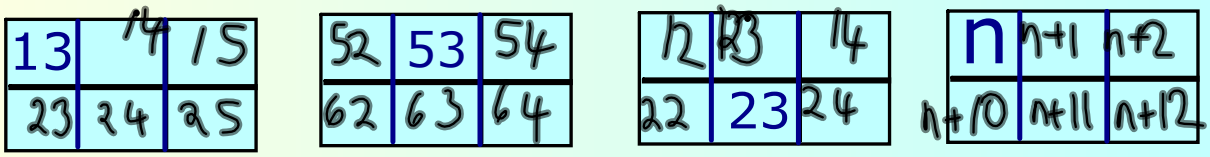
$4(2n+1) = 8n+4$

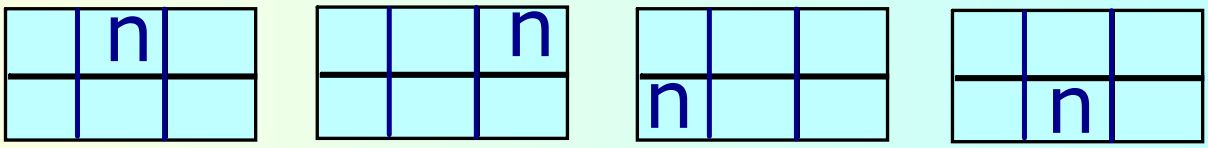
page 372 B1-B5

(B4,B5 are hard)



What happens if..?





Multiply out the bracket

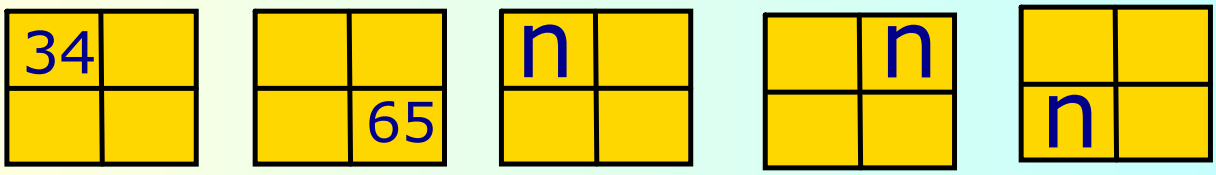
$2(x+5)$

$6(2x+1)$

$7(x-3)$

$5(3-x)$

What happens if..?



13	14	15
23	24	25

52	53	54
62	63	64

	23	

n	n+1	n+2
n+10	n+11	n+12

	n	

		n

+1

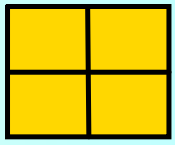
n-10	n- 9	n-8
n	n+1	n+2

n-11	n-10	n-9
n-1	n	n+1

Algebra and Number grids

What happens if..?

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

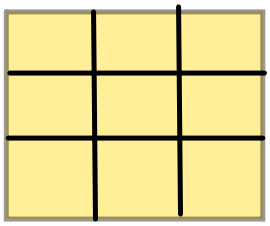


...you add the diagonals?

Can you prove this? (Use algebra)

What happens if you add all the numbers?

Try a 3x3 square.
Does the same thing happen?



For your 3x3 square, add the first column and the last column.
What do you notice?
Why do you think this happens?
Can you prove it?

I'm thinking of a number

I think of a number and add 2.

I think of a number and multiply by 2.

I think of a number, add 3 and multiply by 4.

I think of a number, multiply by 5 and add 2.

What was my number?

$n+2=12$

I think of a number and add 2. I get 12.

I think of a number and multiply by 2. I get 50.

$2n=50$

I think of a number, add 3 and multiply by 4. I get 20.

$4(n+3)=20$

I think of a number, multiply by 5 and add 2. I get 32.

$5n+2=32$

worksheet

DO NOT WRITE ON THE SHEET

Solving Equations

$x + 4 = 9$

$x = 5$

$3x = 30$

$x = 10$

$x - 5 = 12$

$x = 17$

$2x + 1 = 7$

$2x = 6$

$x = 3$

$3x - 2 = 7$

$x = 20$

$\frac{x}{2} = 10$

$x = 15$

$\frac{x}{5} = 3$

$2x - 4 = 16$

$x = 10$

Forming expressions

width = x
length is 4cm more

length is y
width is 6cm less

An isosceles triangle
two sides are b cm
the third side is 3 cm more

short side is x cm
long side is 12 cm more

Solving practical problems

Make and solve equations for the following situations:

Joseph has 20 CDs on a shelf.
7 of them are old. How many are new?

Ollie has 20 magazines. He has the same number about sport as he does about cars. There are 6 others. How many does he have about sport?

Attachments

Algebra pyramids.doc

Algebra pyramids answers.doc

function machines.doc

function machines2.doc

Yr 8 A2.doc