ALGEBRAIC EXPRESSIONS

CONTENT DOMAIN REFERENCES:
A1, A4, A5

KS2 SATS

PRACTICE QUESTIONS BY TOPIC

1 [2010]

k stands for a number.

Complete the number sentences below.

One has been done for you.

5 more than k is $k + 5$

2 less than k is $k - 2$

3 more than twice k is $2k + 3$

6 more than half of k is $\frac{k + 6}{2}$ [OR $\frac{1}{2}k + 6$]

[2 marks]

2 [Extra]

Simplify these expressions.

$5k + 7 + 3k =$ $8k + 7$

$k + 1 + k + 4 =$ $2k + 5$

[2 marks]

3 [Extra]

When $x = 8$, what is the value of $5x$?

Tick (✓) the correct box below.

5×8

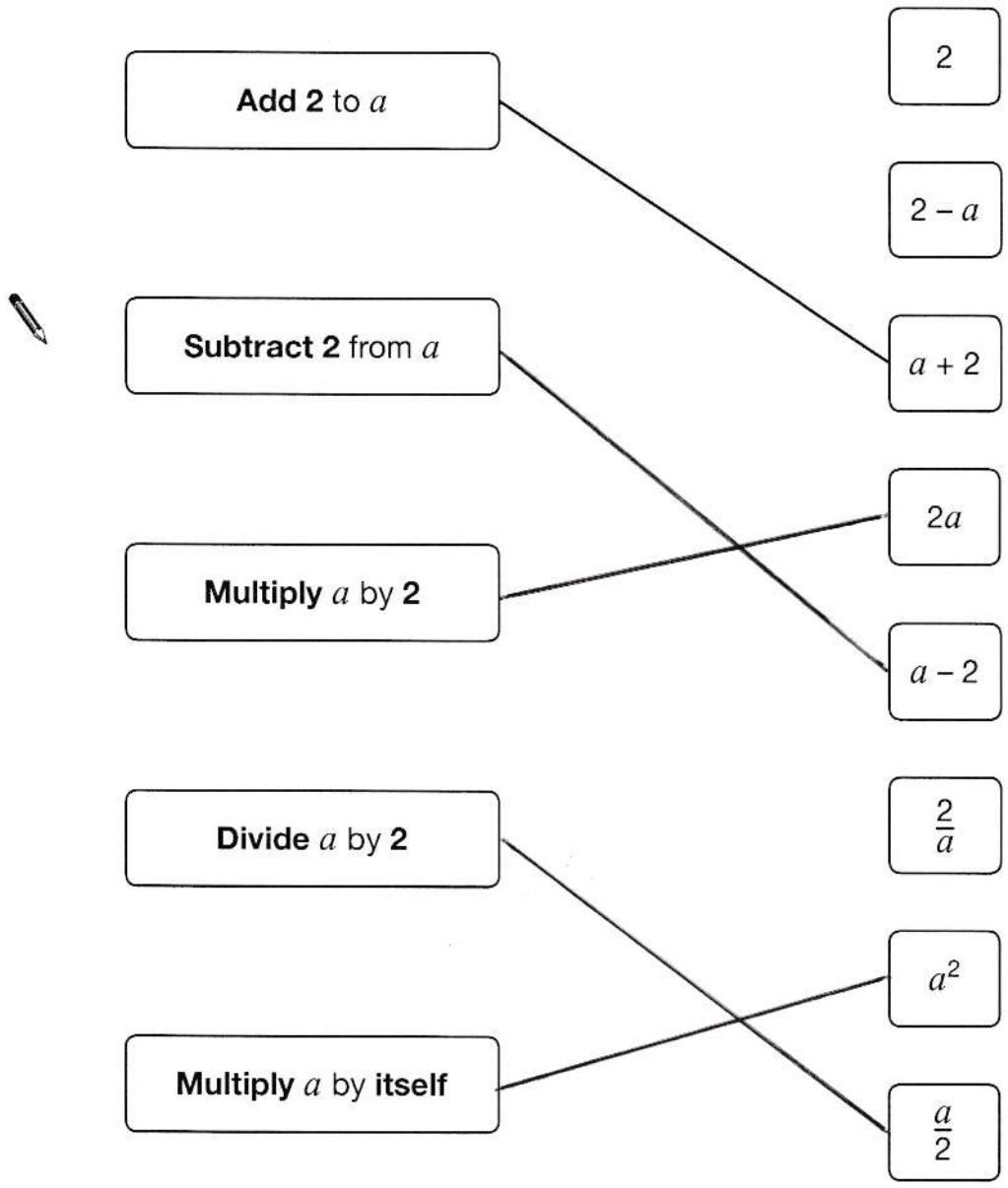
☐ 5 ☐ 13 ☑ 40 ☐ 58 ☐ None of these

[1 mark]

Questions compiled by:
@Maths4Everyone

4 Match each statement to the correct expression.

[Extra] The first one is done for you.



[2 marks]

5 When $x = 8$, what is the value of x^2?

[Extra] Tick (✓) the correct box below.

8^2

☐ 8 ☐ 10 ☐ 16 ☑ 64 ☐ None of these

[1 mark]

6 Here is an expression.

[Extra]

$2a + 3 + 2a$

Which expression below shows it written as simply as possible?

Put a ring round the correct one.

$7a$ $\quad$ $7 + a$ $\quad$ $2a + 5$

$4a + 3$ $\quad$ $4(a + 3)$

Here is a different expression.

$3b + 4 + 5b - 1$

Write this expression as simply as possible.

$8b + 3$

[2 marks]

7 Complete the statements below.

[Extra]

When x is 8 , $4x$ is 32

[4×8]

When x is 12 , $4x$ is 48

[4×12]

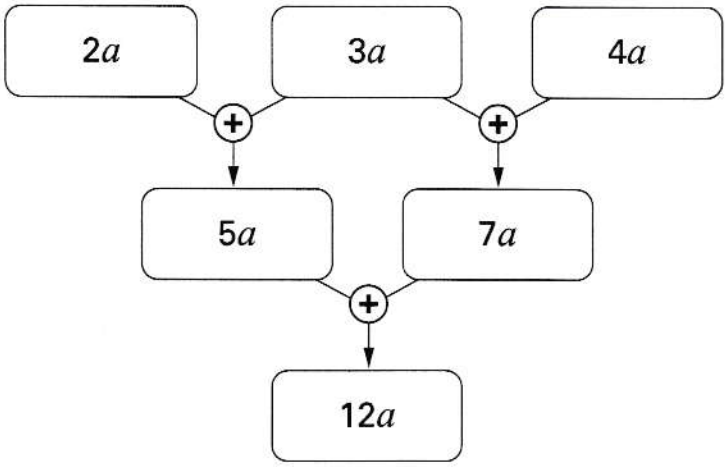
When x is 8 , 6 is 48

[6×8]

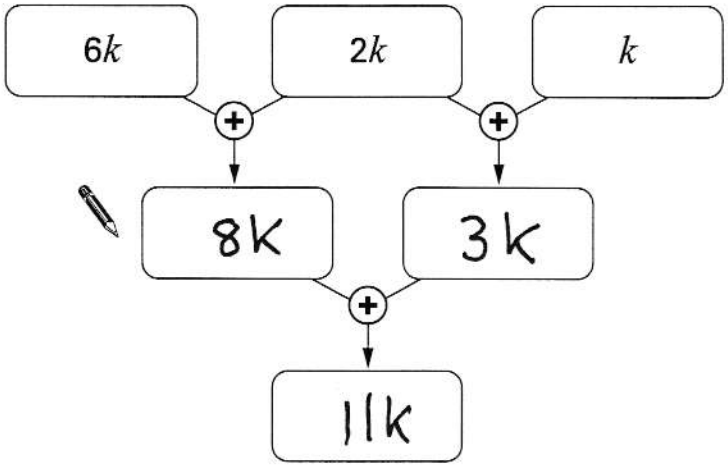
[3 marks]

8 [Extra]

Look at this algebra grid.



Complete the algebra grids below, simplifying each expression.



[2 marks]

9 [Extra]

Look at the three expressions below.

$8 + k$	$3k$	k^2

When $k = 10$, what is the value of each expression?

$8 + k =$ 18 $3k =$ 30 $k^2 =$ 100

[8+10] [3×10] [10²]

[3 marks]

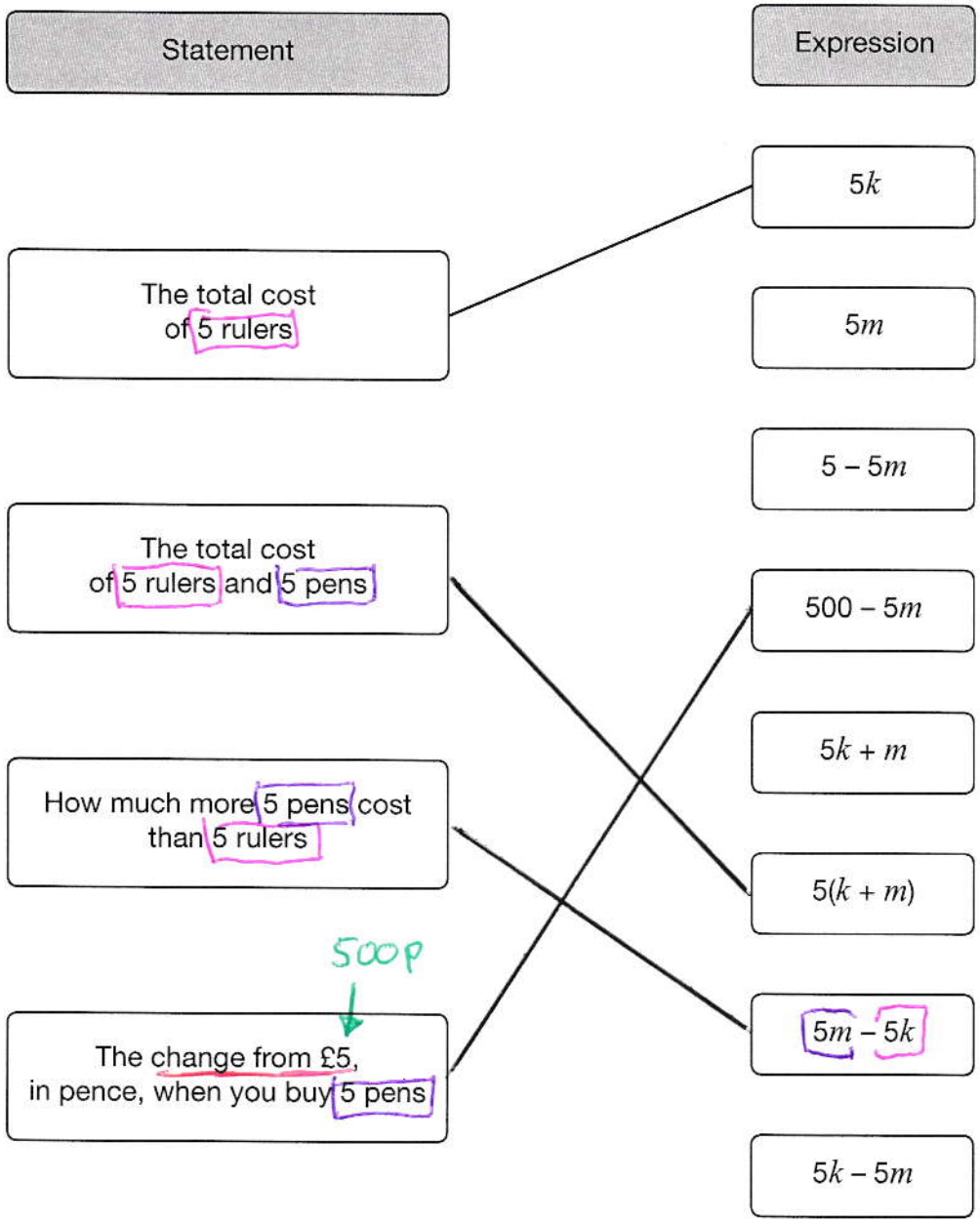
10 [Extra]

A ruler costs k pence.

A pen costs m pence.

Match each statement with the correct expression for the amount in pence.

The first one is done for you.



[5k + 5m]

500p

[2 marks]

11 [Extra]

When $x = 8$, what is the value of $3x - x$?

Tick (✓) the correct box below.

3 × 8 − 8 = 24 − 8

☐ 0 ☐ 3 ☑ 16 ☐ 30 ☐ None of these

[1 mark]

12 Write the missing numbers.

[Extra]

$6x + 2 = 10$

so $6x + 1 =$ 9

[ONE LESS]

$1 - 2y = 10$

so $(1 - 2y)^2 =$ 100

[SQUARE IT!]

[2 marks]

13 When $y = 1$, which expression below has the **largest value**?

[Extra]

Put a ring round it.

$3 + y$ $\quad 3+1=4$

(10 − y) $\quad 10-1=9$

y^2 $\quad 1^2=1$

$3y$ $\quad 3\times1=3$

$\frac{y}{2}$ $\quad \frac{1}{2}$

[1 mark]

14 Look at the equation.

[Extra]

$14n = 98$

Work out the value of **140*n***

[10 TIMES BIGGER!]

980

[1 mark]

15 Look at the equation.

[Extra]

$n + 3 = 12$

Use it to work out the value of $n - 3$

[SIX LESS] 6

Now look at this equation.

$n + 3 = 7$

Use it to work out the value of $n - 6$

[NINE LESS] -2

[2 marks]

16 Here is some information about three people.

[Extra]

- Jo is 2 years older than Harry. → [1ST] [HARRY + 2 !]
- Kate is twice as old as Jo. → [2ND] [2 × JOE]

Write an expression for each person's age using n

The first one is given.

Harry's age n

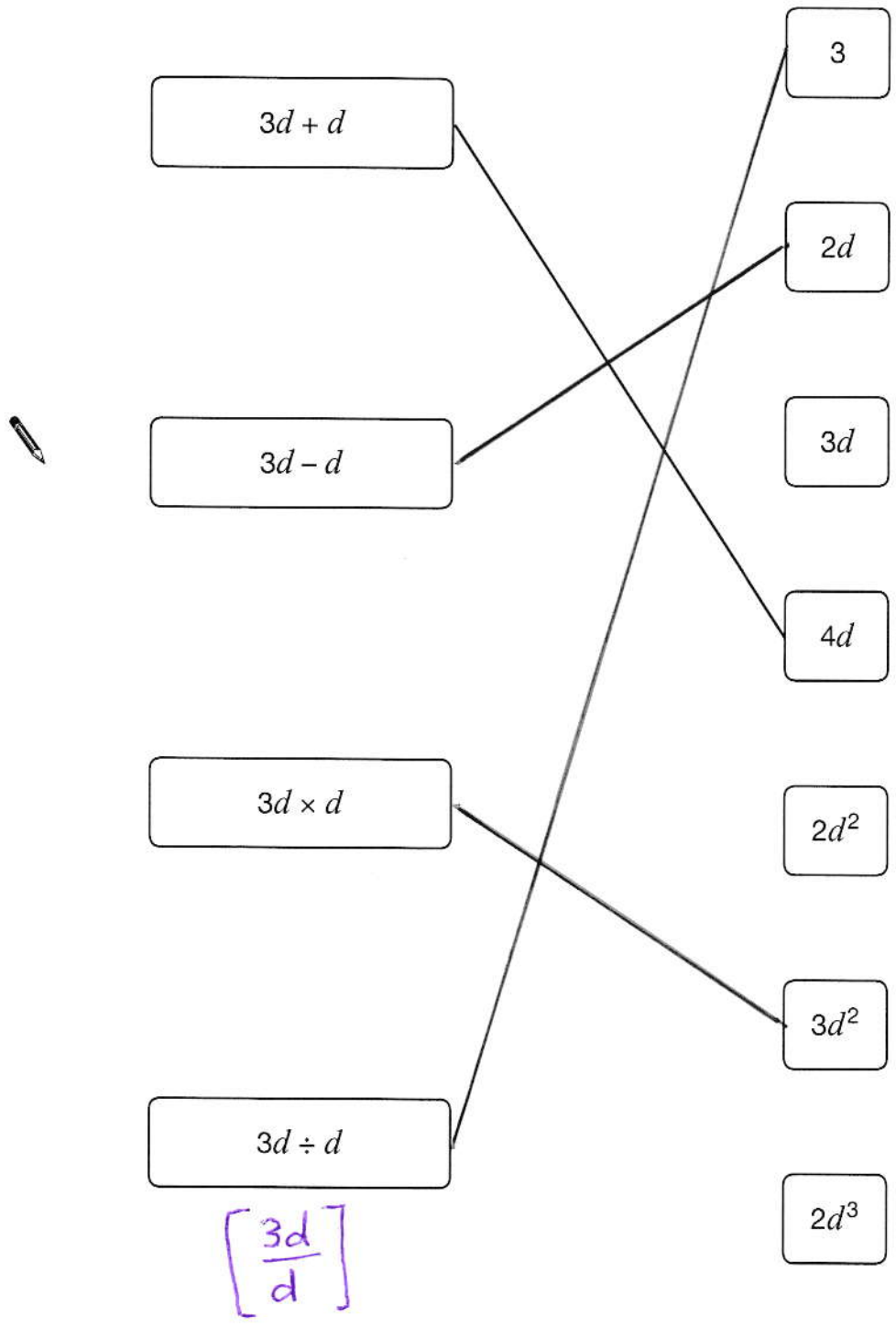
Jo's age $n + 2$

Kate's age $2 \times (n + 2)$

[2 marks]

17 Match each expression on the left with the equivalent expression on the right.

[Extra] The first one is done for you.



[2 marks]

18 When $n = 30$, find the value of $2n + 1$

[Extra]

$2 \times 30 + 1 = 60 + 1$

61

[1 mark]

19 Use $a = 7$ and $b = 28$ to work out the value of these expressions.

[Extra] The first one is done for you.

$a + b =$ 35

$ab =$ 7×28

$$\begin{array}{r} 28 \\ \times\ 7 \\ \hline 196 \\ \hline 5 \end{array}$$

$\frac{b}{a} =$ 4 $\quad \frac{28}{7}$

[3 marks]

20 When $n = 30$, find the value of $2(n + 1)$

[Extra]

$2 \times (30 + 1) = 2 \times 31$

62

[1 mark]

21 [Extra]

It is Tina's birthday. We do not know how old Tina is.

Call **Tina's age**, in years, n

The expressions below compare Tina's age to some other people's ages.

Use words to compare their ages. The first one is done for you.

Tina's age	n
Ann's age	$n + 3$

Ann is *3 years older than Tina*

Tina's age	n
Barry's age	$n - 1$

Barry is 1 YEAR YOUNGER THAN TINA

Tina's age	n
Carol's age	$2n$

Carol is TWICE AS OLD AS TINA

In one year's time Tina's age will be $n + 1$

Write **simplified expressions** to show the ages of the other people in one year's time.

[ADD 1 TO EACH!]

	Tina	Ann	Barry	Carol
Age now	n	$n + 3$	$n - 1$	$2n$
Age in one year's time	$n + 1$	$n+4$	n	$2n+1$

[3 marks]

22 [Extra]

One way to make a magic square is to substitute numbers into this algebra grid.

$a+b$	$a-b+c$	$a-c$
$a-b-c$	a	$a+b+c$
$a+c$	$a+b-c$	$a-b$

Complete the magic square below using the values

$a = 10$ $b = 3$ $c = 5$

13 10+3	12 10-3+5	5
2 10-3-5	10	18 10+3+5
15	8 10+3-5	7 10-3

[2 marks]

23 I **add** the expressions n and $n + 2$

[Extra] Put a ring round the expression that shows the result.

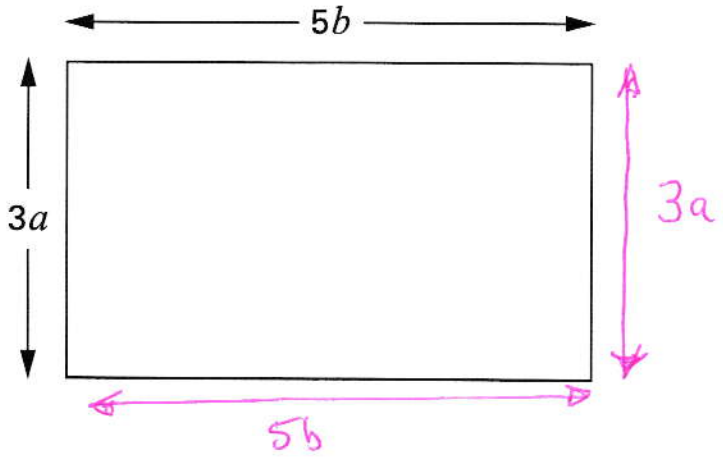
$2n$ $4n$ $n(n + 2)$

$n^2 + 2$ $2n + 2$

[1 mark]

24 The diagram shows a rectangle.

[Extra] Its dimensions are $3a$ by $5b$



Write **simplified expressions** for the area and the perimeter of this rectangle.

Area: 15ab

Perimeter: 6a + 10b

OR 2(3a+5b)

[2 marks]

25 [Extra]

Look at this equation.

$$4 + a = b$$

Write a pair of numbers for a and b to make the equation true.

$a =$ 1 $b =$ 5

[ANY TWO NUMBERS WHERE b IS 4 MORE THAN a]

Now write a **different** pair of numbers for a and b to make the equation true.

$a =$ 2 $b =$ 6

[2 marks]

26 [Extra]

Write the missing numbers so that $2a + 5b = 30$

One is done for you.

$2a + 5b = 30$ when $a = 0$ and $b =$ 6

$2a + 5b = 30$ when $a = 5$ and $b =$ 4

2×5

$10 + 20 = 30$

$2a + 5b = 30$ when $a = 15$ and $b =$ 0

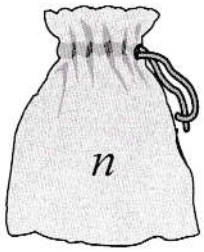
2×15

$30 + 0 = 30$

[2 marks]

27 There are n counters in Alfie's bag.

[Extra]



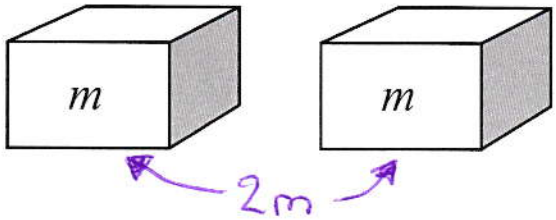
Alfie puts **3** more counters in the bag.

Write an expression for the number of counters that are in the bag now.

n + 3

Megan has two boxes.

There are m counters in each box.



She puts all her counters together in a pile, then removes **5** of them.

Write an expression for the number of counters that are in the pile now.

2m - 5

[2 marks]