

11+ Maths Practice Paper

Year 6 · Advanced

Lesson 5.3: Algebraic expressions and substitution

Read this with your child:

1. This paper has **27 questions** in two parts. Work through them in order. The questions get harder as you go.
2. **Part 1** is multiple choice. Choose **one** answer, A, B, C, D or E, and mark it on the separate answer sheet by drawing a firm line through the box next to its letter. If you change your mind, rub the line out completely and mark your new answer.
3. **Part 2** asks you to write your answer. Write it in the boxes on the answer sheet, **one digit in each box**, starting from the left.
4. If a question is hard, leave it and come back to it at the end.
5. You may use rough paper for working out. You may **not** use a calculator.
6. Suggested time: **35 minutes**.

The answer sheet is after the questions. The answers, with a short explanation of each, are at the back for a parent to mark with.

These are original practice questions written by Elite Learners in the style of 11+ entrance tests. They are not produced by, or connected with, GL Assessment or Cambridge University Press & Assessment (CEM).

Example

Here is an expression: $n + 7$

$$n = -2$$

What is the value of the expression?

A 9

B -5

C 27

D 5

E -9

Answer: D Start at -2 on a number line and jump 7 up: $-2 + 7 = 5$.

The answer, D, has already been marked on your answer sheet.

Now turn over and start Part 1.

Part 1: Multiple choice

1

Here is an expression: $3n - 2m$

$n = 6$ and $m = 4$

What is the value of the expression?

A 14

B 10

C 26

D 2

E 8

2

Here is an expression: $3n$

$n = -5$

What is the value of the expression?

A -8

B -2

C -35

D 15

E -15

3

Think of a number, n . Take 6 away from it, then multiply by 4.

Which expression is this?

A $4(n - 6)$

B $n - 24$

C $4n - 6$

D $6 - 4n$

E $4(6 - n)$

4

Here is an expression: $n - 5$

$n = -4$

What is the value of the expression?

A 1

B -1

C -9

D 20

E 9

5

Here is an expression: $2n + 9$

$n = -3$

What is the value of the expression?

A 3

B -15

C 12

D -3

E 15

6

Here is an expression: $18 - 2n + 7 - 3$

Which expression is always the same?

- A $7 - 18 - 3 + 2n$
- B $18 - 7 + 3 - 2n$
- C $18 + 7 - 3 - 2n$
- D $2n - 18 + 7 - 3$
- E $18 + 2n + 7 - 3$

7

Here is an expression: $p^2 - 3p$

$p = 8$

What is the value of the expression?

- A 26
- B 488
- C 88
- D 40
- E -8

8

Jo says that $n - 4$ and $4 - n$ are always the same.

Raj tests them with $n = 10$.

What does Raj find?

- A $n - 4$ gives 6 and $4 - n$ gives 14
- B $n - 4$ gives 6 and $4 - n$ gives -6
- C $n - 4$ gives 14 and $4 - n$ gives -14
- D $n - 4$ gives 6 and $4 - n$ gives 6
- E $n - 4$ gives -6 and $4 - n$ gives 6

9

Here is an expression: $a + b$

$a = -2$ and $b = 9$

What is the value of the expression?

- A -11
- B -7
- C 11
- D 18
- E 7

10

A school trip costs $12a + 7c$ pounds for a adults and c children.

How many pounds does the trip cost for 3 adults and 20 children?

- A** 42 **B** 188 **C** 261 **D** 176 **E** 437
-

11

Here is an expression: $4n + 30$

$$n = -6$$

What is the value of the expression?

- A** -6 **B** 54 **C** 6 **D** 96 **E** -54
-

12

Here is an expression: $2(3k - 4)$

$$k = 5$$

What is the value of the expression?

- A** 11 **B** 22 **C** 62 **D** 7 **E** 26
-

13

A phone plan costs $\pounds m$ a month, plus $\pounds 30$ to set it up. Ria pays for 12 months.

Which expression shows the total cost, in pounds?

- A** $12m + 30$ **B** $30m + 12$ **C** $m + 12 + 30$ **D** $42m$ **E** $12(m + 30)$
-

14

Here is an expression: $5n - 3$

$$n = -2$$

What is the value of the expression?

- A** 13 **B** 7 **C** -10 **D** -7 **E** -13
-

15

Here is an expression: $b + 2a$

$$a = 3 \text{ and } b = -4$$

What is the value of the expression?

- A** -2 **B** -10 **C** 2 **D** 1 **E** 10
-

16

In this question, $n = -3$.

Which expression has the largest value?

- A** $4n + 20$ **B** $3n + 15$ **C** $n + 10$ **D** $2n$ **E** $n - 4$
-

17

In this question, $n = 10$.

Which two expressions give the same answer?

- A** $n - 2$ and $2 - n$
B n^2 and $2n$
C $n \div 5$ and $5 \div n$
D $2n + 5$ and $5 + 2n$
E $3n$ and $n + 3$
-

18

Think of a number, n . Divide it by 3, then add 8.

Which expression is this?

- A** $n \div (3 + 8)$ **B** $n \div 3 + 8$ **C** $3 \div n + 8$ **D** $(n + 8) \div 3$ **E** $3n + 8$
-

19

Here is an expression: $6n + 2$

$n = -1$

What is the value of the expression?

- A** 4 **B** 3 **C** 8 **D** -8 **E** -4
-

20

The temperature on a mountain is $15 - 6h$ °C, where h is the height in kilometres.

What is the temperature at a height of 4 kilometres?

- A** 36 °C **B** 21 °C **C** -49 °C **D** -9 °C **E** 9 °C

Part 2: Write your answer

21

Here is an expression: $a^2 + b^2$

$a = 7$ and $b = 3$

What is the value of the expression?

Write your answer in the boxes on the answer sheet, one digit in each box.

22

Here is an expression: $5(2n - 9)$

$n = 12$

What is the value of the expression?

Write your answer in the boxes on the answer sheet, one digit in each box.

23

Here is an expression: $3n + 40$

$n = -4$

What is the value of the expression?

Write your answer in the boxes on the answer sheet, one digit in each box.

24

A gardener charges $18h + 35$ pounds for h hours of work.

How many pounds does 6 hours of work cost?

Write your answer in the boxes on the answer sheet, one digit in each box.

25

Here is an expression: $pq - 2p + q$

$p = 9$ and $q = 4$

What is the value of the expression?

Write your answer in the boxes on the answer sheet, one digit in each box.

26

Here is an expression: $2(n + 15)$

$n = -7$

What is the value of the expression?

Write your answer in the boxes on the answer sheet, one digit in each box.

27

Here is an expression: $(n^2 - 25) \div 10$

$n = 15$

What is the value of the expression?

Write your answer in the boxes on the answer sheet, one digit in each box.

Answer sheet

11+ Maths Practice Paper · Year 6 · Lesson 5.3: Algebraic expressions and substitution

Name

Draw a firm line through the box next to your answer, like the example.

Part 1: Multiple choice

Ex	A ☐	B ☐	C ☐	D ☒	E ☐
1	A ☐	B ☐	C ☐	D ☐	E ☐
2	A ☐	B ☐	C ☐	D ☐	E ☐
3	A ☐	B ☐	C ☐	D ☐	E ☐
4	A ☐	B ☐	C ☐	D ☐	E ☐
5	A ☐	B ☐	C ☐	D ☐	E ☐
6	A ☐	B ☐	C ☐	D ☐	E ☐
7	A ☐	B ☐	C ☐	D ☐	E ☐
8	A ☐	B ☐	C ☐	D ☐	E ☐
9	A ☐	B ☐	C ☐	D ☐	E ☐
10	A ☐	B ☐	C ☐	D ☐	E ☐
11	A ☐	B ☐	C ☐	D ☐	E ☐
12	A ☐	B ☐	C ☐	D ☐	E ☐
13	A ☐	B ☐	C ☐	D ☐	E ☐
14	A ☐	B ☐	C ☐	D ☐	E ☐
15	A ☐	B ☐	C ☐	D ☐	E ☐
16	A ☐	B ☐	C ☐	D ☐	E ☐
17	A ☐	B ☐	C ☐	D ☐	E ☐
18	A ☐	B ☐	C ☐	D ☐	E ☐
19	A ☐	B ☐	C ☐	D ☐	E ☐
20	A ☐	B ☐	C ☐	D ☐	E ☐

Part 2: Write your answer, one digit in each box

21			
22			
23			
24			
25			
26			
27			

Answers

For a parent to mark with. One mark for each question: the paper is out of 27. Talk through any your child got wrong, using the explanation.

Q	Answer	How to get it
1	B 10	$3 \times 6 = 18$ and $2 \times 4 = 8$, then $18 - 8 = 10$.
2	E -15	3 lots of -5: three jumps of 5 down from 0 land on -15.
3	A $4(n - 6)$	The taking away comes first, so it goes in brackets: $4(n - 6)$.
4	C -9	Start at -4 and jump 5 down: $-4 - 5 = -9$.
5	A 3	$2 \times (-3) = -6$, then $-6 + 9 = 3$.
6	C $18 + 7 - 3 - 2n$	Each term keeps the sign in front of it: 18, then + 7, - 3 and - 2n.
7	D 40	p^2 is $8 \times 8 = 64$ and $3p$ is $3 \times 8 = 24$, then $64 - 24 = 40$.
8	B $n - 4$ gives 6 and $4 - n$ gives -6	$n - 4 = 10 - 4 = 6$ and $4 - n = 4 - 10 = -6$. They are not the same, so Jo is wrong.
9	E 7	Start at -2 and jump 9 up: $-2 + 9 = 7$.
10	D 176	$12 \times 3 = 36$ and $7 \times 20 = 140$, then $36 + 140 = 176$. The trip costs £176.
11	C 6	$4 \times (-6) = -24$, then $-24 + 30 = 6$.
12	B 22	Brackets first: $3 \times 5 - 4 = 11$, then $2 \times 11 = 22$.
13	A $12m + 30$	12 months cost $12m$ pounds, and the £30 is paid once: $12m + 30$.
14	E -13	$5 \times (-2) = -10$, then $-10 - 3 = -13$.
15	C 2	$2 \times 3 = 6$. Start at -4 and jump 6 up: $-4 + 6 = 2$.
16	A $4n + 20$	$4n + 20 = 8$, $n + 10 = 7$, $3n + 15 = 6$, $2n = -6$ and $n - 4 = -7$. The largest is $4n + 20$.
17	D $2n + 5$ and $5 + 2n$	$2n + 5$ and $5 + 2n$ are the same terms in a different order: both are 25. The others give 30 and 13, 8 and -8, 2 and 0.5, 100 and 20.
18	B $n \div 3 + 8$	Divide first, then add: $n \div 3 + 8$. No brackets are needed.
19	E -4	$6 \times (-1) = -6$, then $-6 + 2 = -4$.
20	D -9°C	Multiply first: $6 \times 4 = 24$, then $15 - 24 = -9$. It is -9°C .
21	58	$7 \times 7 = 49$ and $3 \times 3 = 9$, then $49 + 9 = 58$.
22	75	Brackets first: $2 \times 12 - 9 = 15$, then $5 \times 15 = 75$.
23	28	$3 \times (-4) = -12$, then $-12 + 40 = 28$.
24	143	Swap h for 6: $18 \times 6 + 35 = 108 + 35 = 143$. It costs £143.
25	22	pq is $9 \times 4 = 36$ and $2p$ is 18, then $36 - 18 + 4 = 22$.
26	16	Brackets first: $-7 + 15 = 8$, then $2 \times 8 = 16$.
27	20	Brackets first: $15 \times 15 = 225$, and $225 - 25 = 200$. Then $200 \div 10 = 20$.

Score: out of 27