SCORE A+

Algebra

With Classified answer book

8

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3- Substitution

1. When x = 5, work out the values of the expressions below.

$2x + 13 =$ .....

$5x - 5 =$ .....

$3 + 6x =$ .....

2. a) Work out the value of $2a + ay$ when $a = 5$ and $y = -3$

.....

(b) Work out the value of $5t^2 - 7$ when $t = -2$

.....

3. $A = \frac{h(x+10)}{2}$

$A = 15 \quad x = 5$

Work out the value of h

$h =$ .....

4.(a) When $x = 8$, what is the value of $5x$?

Tick (✓) the correct box below.

☐ 5 ☐ 13 ☐ 40 ☐ 58 ☐ None of these

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

Tick (✓) the correct box below.

☐ 0 ☐ 3 ☐ 16 ☐ 30 ☐ None of these

(c) When $x = 8$, what is the value of x^2?

Tick (✓) the correct box below.

☐ 8 ☐ 10 ☐ 16 ☐ 64 ☐ None of these

5.Look at this equation.

$y = x + 9$

(a) When $x = -7$, what is the value of y?

_____

(b) When $y = -7$, what is the value of x?

_____

6. Look at this equation.

$$y = 2x^3 + 10$$

(a) When $x = 2$, what is the value of y?

_____

(b) When $x = -2$, what is the value of y?

_____

(c) Which equation below gives the same value of y for both x = 4 and x = –4?

Put a ring round the correct equation.

$y = 2x$ $\quad$ $y = 2 + x$ $\quad$ $y = x^2$ $\quad$ $y = \frac{x}{2}$

7. Complete the statements below.

When x is ..... , $4x$ is .....

When x is ..... , $4x$ is 48

When x is 8 , ... is 48

8. A teacher said:

> Choose values for *a* and *b*
> Use the letters to make expressions for the numbers 1 to 8

(a) One group of pupils chose a = 12 and b = 3

Complete their table.

$a =$ $b = 3$
$b - a = 1$
$a =$
$b = 3$
$2 \times a = 4$
$= 5$
$a \times b = 6$
$2 \times a + b = 7$
$= 8$

(b) Here is part of the table from a **different** group of pupils.

$\times a = 6$
$a + b = 7$

What values did they choose?

$a =$_____ $b =$_____

9. (a) Look at this equation.

$$x + y = 30$$

What could the values of x and y be?

Give one pair of values.

$x =$ ..... $y =$ .....

Now give a **different** pair of values that x and y could be.

$x =$ ..... $y =$ .....

(b) Here is a different equation.

$$a - b = 30$$

When a = 40, what is the value of b? b = ...

10. For each statement below, tick(,) the values of n for which the statement is true.

The first row is done for you.

	$n = 4$	$n = 5$	$n = 6$	$n = 7$
n is greater than 5			✓	✓
$2n$ is equal to 10				
$2 + n$ is less than 8				
n^2 is less than 30				

11. Look at the information.

$x = 4$	$y = 13$

Complete the rules below to show **different** ways to get y using x

The first one is done for you.

To get y, **multiply** x by 2 and **add** 5

This can be written as $y = 2x + 5$

To get y, **multiply** x by _____ and **add** _____

This can be written as $y =$ _____

To get y, **multiply** x by _____ and **subtract** _____

This can be written as $y =$ _____

To get y, **divide** x by _____ and **add** _____

This can be written as $y =$ _____

12. Kevin says:

When $x = 3$ and $y = 10$, the value of $\frac{2y}{x+1}$ is **5**

Is Kevin correct? Tick (✓) Yes or No. ☐ Yes ☐ No

Explain your answer.

13. Look at the three expressions below.

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

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

$8 + k =$ _____ $3k =$ _____ $k^2 =$ _____

14. Write the missing values in this table.

y	$2y$	y^2
3	6	
2		
		36

15. Work out the values of these expressions, when x equals 6

$5x + 2 =$ . . . . . .

$5(x + 2) =$ . . . . . .

16. Write **numbers** in the boxes to make the statements true.

When $x =$ ☐ then $x + 3 =$ ☐

When $x =$ ☐ then $3x =$ ☐

When $x =$ ☐ then $\frac{x}{3} =$ ☐

17. (a) Look at this equation.

$ab = 24$

Write four different solutions to the equation.

$a =$ ..... $b =$ ....

$a =$ ..... $b =$ ....

$a =$ ..... $b =$ ....

$a =$ ..... $b =$ ....

(b) Now look at this equation.

$a + b = 10$

What values of a and b are solutions to **both** [$ab = 24$] and [$a + b = 10$] ?

$a =$ ..... $b =$ ....

18. Here is an expression $\frac{3(x-2)^2}{5}$

A value of x is substituted into the expression.

Tick (✓) the operation that is performed **first** when the value of this expression is calculated.

- × 3 ☐
- –2 ☐
- Square ☐
- ÷ 5 ☐

19. Join pairs of algebraic expressions that have the same value

when $a = 3$, $b = 2$ and $c = 6$

One pair is joined for you.