SCORE A+

Algebra

With Classified answer book

8

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8- Solving Equations

1. (a) Solve $2y = 8$

$y =$ .....

(b) Solve $t - 4 = 7$

$y =$ .....

(c) Solve $7y = 54$

$y =$ .....

(d) Solve $2t - 5 = 9$

$t =$ .....

2. (a) Solve $5g + 3 = 18$

$g =$ .....

(b) Solve $y + 5 = 12$

$y =$ .....

(c) Solve $\frac{2x}{4} = 3$

$x =$ .....

(d) Solve $\frac{5h}{2} = 10$

$h =$ .....

3. Solve $3x + 1 = x + 9$

$x =$ .....

4. Solve $5t - 4 = 3t + 6$

$t =$ .....

5. Solve $4y + 3 = y + 6$

$y =$ .....

6. Solve $2y + 17 = 6y + 5$

$y =$ .....

7. Solve $5(y + 1) = 3y + 13$

$y =$ .....

8. Solve $3y + 10 = 5(y + 4)$

$y =$ .....

9. (a) Fill in the missing number to make the equation correct.

When $k = 5$, $4k + \square = 3k + 15$

(b) What is the value of k in this equation?

$$7k - 3 = 5k + 2$$

k = ...

10. Here is an equation.

$$x + 30 = 100$$

Raj says that $x = 130$

Is he correct?

☐ Yes ☐ No

Explain your answer.

11. Solve these equations.

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

b = ...

12. Look at this equation.

$$4 + a = b$$

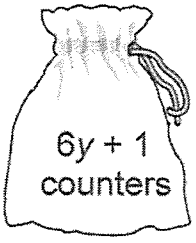
Write a pair of numbers for a and b to make the equation true.

$a =$ _____ $b =$ _____

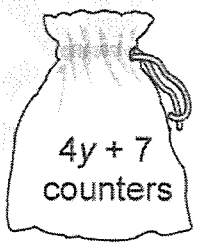
Now write a **different** pair of numbers for a and b to make the equation true.

$a =$ _____ $b =$ _____

13. (a) Bags A and B contain some counters.



Bag A



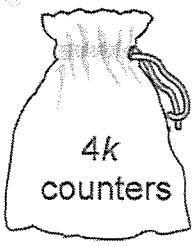
Bag B

The number of counters in each bag **is the same.**

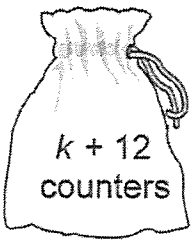
Work out the value of y

_____

(b) Bag **C** contains **more** counters than bag **D**.



Bag C



Bag D

What is the **smallest** possible value of k?

_____

14. Look at these expressions.

$5y - 8$	$3y + 5$
first expression	second expression

(a) What value of y makes the two expressions equal?
Show your working.

y = ...

(b) What value of y makes the first expression **twice** as great as the second expression?
Show your working.

y = ...

15. Work out the values of *a*, *b* and *c* in the number sentences below.

$3 \times 10 + 4 = a$ $\quad a =$ .....

$3 \times 10 + b = 38$ $\quad b =$ .....

$c \times 10 + 12 = 52$ $\quad c =$ .....

16. (a) Here are two equations.

$k = a + b$
$a + b + k = 30$

What is the value of *k*? $\quad k =$ _____

(b) Look at this information.

$10 = c + d$
c is one more than *d*

What is the value of *c*?

$c =$ _____

(c) Now look at this information.

$10 = e + f$
e is more than *f*

What else can you say about the value of *e*?

17. Solve these equations using an algebraic method.

You **must** show your working.

$$\frac{5(3y-4)}{2y} = 7$$

y = _____

18. (a) Look at the equation.

$n + 3 = 12$

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

_____

(b) Now look at this equation.

$n + 3 = 7$

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

_____

19. $4n + 2 = 14$

What is the value of $2n + 1$?

. . . . . .

Use n to write a different expression that is equal to 21

. . . . . = 21

20. The equation shows how much you pay to hire a car.

N stands for the number of days

$$N \times 20 = T$$

T stands for the total you pay in £

(a) Leena hires the car for **10 days.**

How much must she pay?

£ _____

(b) Later, Tom pays **£280** to hire the car.

For **how many days** does he hire the car?

_____ days

21. One of the methods for finding equivalent expressions for algebraic fractions is by means of division:

$$\begin{aligned}
\frac{7x^2+5x}{x} &= \frac{1}{x}(7x^2+5x) && [\text{just as } \frac{3}{5} = 3 \times \frac{1}{5}] \\
&= (\frac{1}{x} \times 7x^2) + (\frac{1}{x} \times 5x) && [\text{distributive property}] \\
&= \frac{7x^2}{x} + \frac{5x}{x} \\
&= 7x + 5 && [\text{provided } x \neq 0]
\end{aligned}$$

Use the method shown above to simplify each fraction below.

$\frac{8x+10z+6}{2}$

$\frac{9x^2y+xy}{xy}$

22. Look at this equation.

$$x + 3y = 16$$

Use it to find the value of these expressions.

$2x + 6y$ = ...

$\dfrac{x + 3y}{8}$ = ...

$\sqrt{x + 3y}$ = ...

23. Write the missing numbers.

$6x + 2 = 10$

so $6x + 1 =$ ______

$1 - 2y = 10$

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

24. A triangle has three sides that are **13 cm**, **y + 8 cm** and **3y + 1cm** long.

The triangle is **isosceles.**

What could the lengths of the sides be?

There are three different answers.

Write all three answers.

First answer: .... cm .... cm .... cm

Second answer: .... cm .... cm .... cm

Third answer: .... cm .... cm .... cm

9- Forming and Solving Equations

1.

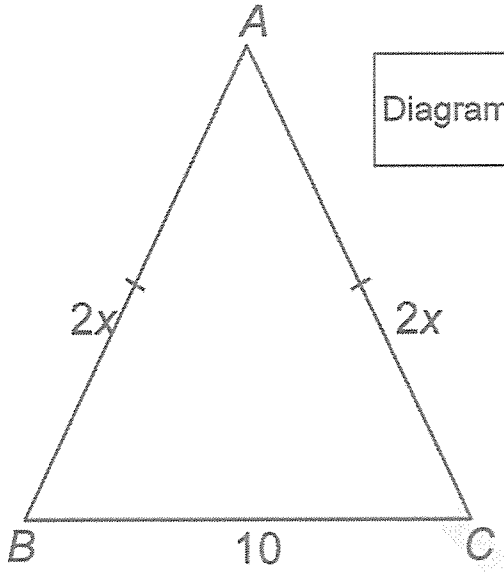


Diagram **NOT** accurately drawn

In the diagram, all measurements are in centimetres.

ABC is an isosceles triangle.

AB = 2*x*
AC = 2*x*
BC = 10

(a) Find an expression, in terms of *x*, for the **perimeter** of the triangle.
Simplify your expression.

.....

The perimeter of the triangle is 34 cm.

(b) Find the value of *x*.

x =.....