Simplify

Simplify $\quad a + a + a + a + a + a$

[1 mark]

Answer _____

Simplify $\quad 7 \times b \times c$

[1 mark]

Answer _____

Simplify $\quad 12 \times d \times d \times d$

[1 mark]

Answer _____

Write as a single fraction in its simplest form $\quad (5 \times m \times m) \div (8 \times n)$

[1 mark]

Answer _____

Write as a single fraction in its simplest form $\quad (4 \times n \times n \times 5) \div (2 \times m \times 7)$

[2 marks]

_____

_____

Answer _____

Circle the expression that describes 20 more than x.

[1 mark]

$20 > x$ $\qquad$ $x + 20$ $\qquad$ $20x$ $\qquad$ $x - 20$

Simplify $2 \times 6 \times a \times a \times b \times b \times b$ using index notation

Answer _____

Expand and Simplify

Expand and simplify

(a) $2(3h + 6) + 5(4h + 2)$

[3 marks]

_____

_____

Answer _____

(b) $6(3j - 2) - 4(2j + 4)$

[3 marks]

_____

_____

_____

Answer _____

Multiply out $5(2a - 7)$

[2 marks]

_____

Answer _____

Expand and simplify

(a) $7(2x + 3) + 4(6x + 9)$

[2 marks]

_____

_____

Answer _____

(b) $8(4y - 3) - 3(5y + 1)$

[3 marks]

_____

_____

_____

Answer _____

Simplify fully $5t + 2w + 3t - w$

[2 marks]

_____

_____

Answer _____

Expand and simplify $2(3x - 1) - (x - 2)$

[3 marks]

_____

_____

_____

Answer _____

Factorise

Factorise fully each of the following expressions

(a) $20a + 16$

[1 mark]

_____

Answer _____

(b) $30b - 45$

[1 mark]

_____

Answer _____

(c) $16c^3 + 24c$

[2 marks]

_____

_____

Answer _____

Factorise fully each of the following expressions

$10x + 15$

[1 mark]

Answer _____

$36x - 48$

[1 mark]

Answer _____

$27x + 45x^5$

[2 marks]

Answer _____

$44x^3y^2 - 33xy^4$

[2 marks]

Answer _____

Solve

(a) Solve $\dfrac{x}{10} = 5$

[1 mark]

_____

$x =$ _____

(b) Solve $2y - 9 = 18$

[2 marks]

_____

_____

$y =$ _____

(c) Solve $4w + 3 = 20 - 6w$

[3 marks]

_____

_____

_____

_____

$w =$ _____

1 (a) Solve $7x = 42$

[1 mark]

$x = $ _____

1 (b) Solve $y - 9 = 22$

[1 mark]

$y = $ _____

1 (c) Solve $4z + 9 = 3$

[2 marks]

$z = $ _____

Here are two number machines.

input → x → [× 5] → [− 3] → output

input → x → [× 3] → [+ 4] → output
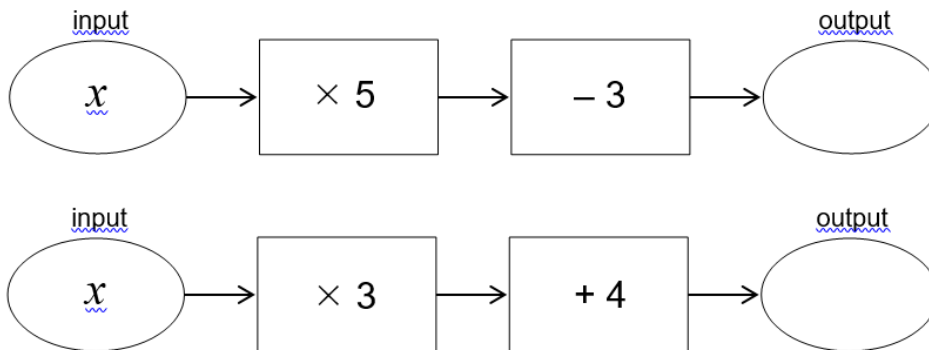
Work out the value of x for which both machines have the same output.

[3 marks]

_____

_____

_____

Answer _____

$3 - 4x = 0$

Work out x.

_____

$x =$ _____

$2x - 6 = 3 - 4x$

Work out x.

_____

$x =$ _____

Solve the equation $3x + 14 = 2$

_____

_____

$x =$ _____

Solve the equation $5x + 1 = 2(x + 4)$

_____

_____

_____

Answer _____

Work out the smallest integer value that satisfies $4x + 3 > 20$

[3 marks]

_____

_____

_____

Answer _____

Solve $2x - 6 < 3 - 4x$

[2 marks]

_____

Answer _____
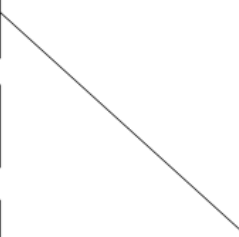
Definition

Match each card on the left with a card on the right.
The first one is done for you.

[2 marks]

5 more than n	n - 5
Double n	$2n + 1$
5 less than n	$n + 5$
n squared	$2(n + 1)$
Double n then add 1	n^2
Add 1 then double the answer	$2n$
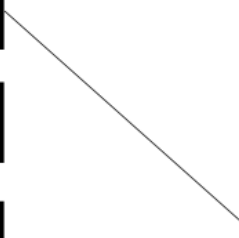
Match each of the following by drawing a line.
The first one has been done for you.

[2 marks]

$2n + 5 > 18$	Equation
$6(n - 5) = 42$	Expression
$w = 7h + 30$	Inequality
$5(n - 6)$	Formula
$4(n + 7) \equiv 4n + 28$	Identity

Use one of these words to describe each of the following

[3 marks]

Expression   Equation   Identity   Formula   Inequality
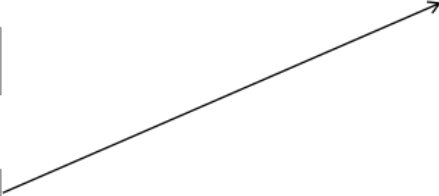
(a)   5x + 3 = 2x – 6   _____

(b)   6a(2a – 7) ≡ 12a^2 – 42a   _____

(c)   C = 12n + 36   _____

Match the boxes on the right with the equivalent box on the left.

One of them has been done for you.

[3 marks]

$2x + 1 = 9$

Formula

$4x + 2 \equiv 2(2x + 1)$

Equation

$D = ST$

Inequality

$x + 5$

Identity

Expression
with 3 terms

$2x + 5y + 1$

$x \geq 2$

Sequences

Here is a linear sequence.
The first two terms are missing.

...   ...   3   9   15   21   27   ...

(a) Describe how the sequence is building up.

[1 mark]

_____

_____

(b) What is the first term of the sequence?

[1 mark]

Answer _____

Write down the next term of each of these sequences.

(a)

4   9   16   25   36   ...

[1 mark]

Answer _____

(b)

1   1   2   3   5   8   13   ...

[1 mark]

Answer _____

The nth term of a sequence is $\quad 7n - 3$

(a) Work out the first three terms of the sequence.

[1 mark]

Answer _____ , _____ , _____

(b) Which term of the sequence has a value of 109?

[2 marks]

Answer _____

(a) Work out the next term of the quadratic sequence.

6   10   16   24   34   …

[1 mark]

Answer _____

(b) Work out the next term of the geometric sequence.

3   9   27   81   243   …

[1 mark]

Answer _____

Here is a sequence.

15   13   11   9   7   …

Circle the expression for the nth term of the sequence.

[1 mark]

$2n + 13$ $n - 2$ $17 - 2n$ $15 - 2n$

Worded Problems

Carys has just had a birthday.
She is now A years old.
Her brother, Joshua is 2 years younger.
Her sister, Kiah, is twice as old as Joshua.

Write down an expression for their total age.
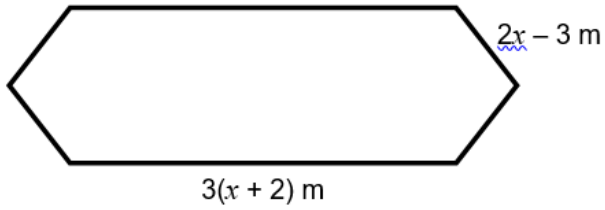
[3 marks]

_____

_____

_____

Answer _____

Mr Mistry has 3 grandchildren.
He gives Nimisha £m.
He gives Sunhil £80 less than Nimisha.
He gives Akshay twice as much as Sunhil.

Write down an expression for the total amount of money he gives them.

[3 marks]

_____

_____

Answer £ _____

Sam wants to build a water play area for children.

He wants the shape to have **two** lines of symmetry.

$2x - 3$ m

$3(x + 2)$ m

Work out an expression for the total perimeter of the shape.

[4 marks]

_____

_____

_____

_____

Answer _____ m

Jean pays for gas, electricity and water every month.

Her gas bill is £G per month.
Her electricity bill is £10 per month more than her gas bill.
Her water bill is half the electricity bill.

Write down an expression for the total cost of the bills for 1 year.

[4 marks]

_____

_____

_____

Answer £ _____

A shop gives reward points based on the money in £ spent by a customer.
It uses this formula.

reward points = 2 × money spent + bonus

The bonus is worked out using this table.

Money spent (to the nearest £)	1 to 20	21 to 50	50 to 100	More than 100
Bonus	5	10	20	25

a)   Amy spent £34

Work out her reward points.

[2 marks]

_____

_____

_____

Answer _____

(b)   Bob was given 220 reward points.

How much, to the nearest £, did he spend?

[2 marks]

_____

_____

_____

_____

Answer £ _____

A teacher asks her class to write a question that combines algebra and geometry.
This is Shana's question.

> A hexagon has angles of
> $5x$, $5x$, $4x$, $3x$, $2x$ and x.
>
> Work out the value of x.
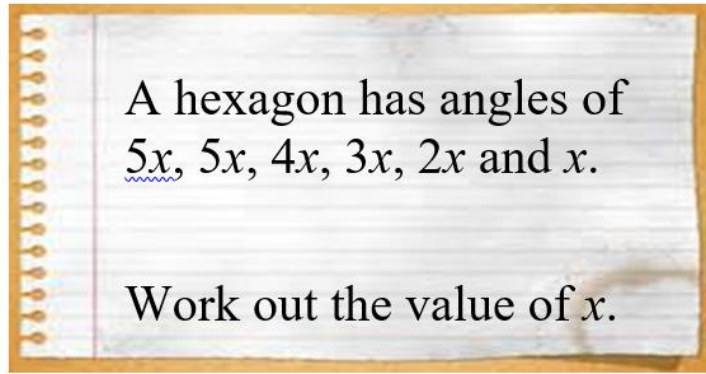
Solve Shana's question.

[3 marks]

_____

_____

_____

$x =$ _____ degrees

(a) I think of a number.
I multiply it by 2 and subtract 1
The answer is 4

What number did I think of ?

[1 mark]

Answer _____

(b) The sum of two numbers is 6
The difference of the two numbers is 3

What are the two numbers?

[1 mark]

_____

Answer _____ , _____

A ruler costs 20p
A pen costs 15p

Write down the total cost of x rulers and y pens.

[1 mark]

Answer _____ p