08.02.21 Solve Two-Step Equations

Reasoning and problem solving—Maths extension

Answer and reason the questions below to deepen your mathematical understanding. Once complete, self-mark using the answer sheet.

1) The length of a rectangle is $2x + 3$
The width of the same rectangle is $x - 2$
The perimeter is 17 cm.

Find the area of the rectangle.

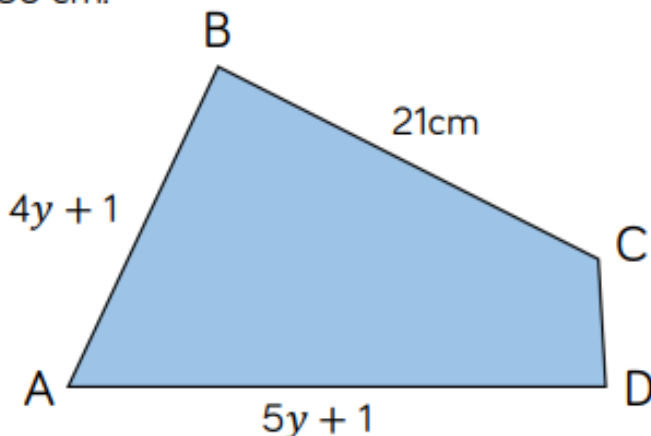**2)** Alex has some algebra expression cards.

$$y + 4$$

$$2y$$

$$3y - 1$$

The mean of the cards is 19
Work out the value of each card.

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3) Here is the quadrilateral ABCD.

The perimeter of the quadrilateral is 80 cm.

AB is the same length as BC.

Find the length of CD.

Answers can be found on the next page.

ANSWER SHEET

1) The length of a rectangle is $2x + 3$
The width of the same rectangle is $x - 2$
The perimeter is 17 cm.

Find the area of the rectangle.

$$6x + 2 = 17$$
$$6x = 15$$
$$x = 2.5$$
$$\text{Length} = 8 \text{ cm}$$
$$\text{Width} = 0.5 \text{ cm}$$
$$\text{Area} = 4 \text{ cm}^2$$

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2)
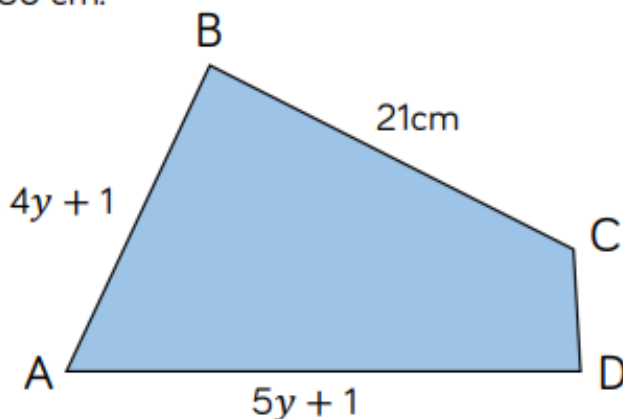Alex has some algebra expression cards.

$y + 4$

$2y$

$3y - 1$

The mean of the cards is 19
Work out the value of each card.

$$6y + 3 = 57$$
$$6y = 54$$
$$y = 9$$

Card values:
13
18
26

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3) Here is the quadrilateral ABCD.

The perimeter of the quadrilateral is 80 cm.

AB is the same length as BC.

Find the length of CD.

$$4y + 1 = 21$$
$$4y = 20$$
$$y = 5$$

$AB = 21 \text{ cm}$
$BC = 21 \text{ cm}$
$AD = 26 \text{ cm}$
$CD = 80 - (21 + 21 + 26) = 12 \text{ cm}$

Reasoning and problem solving—Maths extension

Answer and reason the questions below to deepen your mathematical understanding. Once complete, self-mark using the answer sheet.

1) a, b and c are integers between 0 and 5

$$a + b = 6$$
$$b + c = 4$$

Find the values of a, b and c

How many different possibilities can you find?

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2) x and y are both positive whole numbers.

$$\frac{x}{y} = 4$$

Dora says,

x will always be a multiple of 4

Jack says,

y will always be a factor of 4

Only one is correct – who is it?
Explain your answer.

Answers can be found on the next page.

1) a, b and c are integers between 0 and 5

$$a + b = 6$$
$$b + c = 4$$

Find the values of a, b and c

How many different possibilities can you find?

Possible answers:

$a = 4$ $b = 2$
$c = 2$

$a = 3$ $b = 3$
$c = 1$

$a = 2$ $b = 4$
$c = 0$

2) x and y are both positive whole numbers.

$$\frac{x}{y} = 4$$

Dora says,

x will always be a multiple of 4

Jack says,

y will always be a factor of 4

Only one is correct – who is it?
Explain your answer.

Possible answer:

Dora is correct as x will always have to divide into 4 equal parts e.g.
$32 \div 8 = 4$,
$16 \div 4 = 4$

Jack is incorrect.
$40 \div 10 = 4$ and 10 is not a factor of 4

Reasoning and problem solving—Maths extension

Answer and reason the questions below to deepen your mathematical understanding. Once complete, self-mark using the answer sheet.

1) $ab + b = 18$

Mo says,

> a and b must both be odd numbers

Is Mo correct?
Explain your answer.

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2) Large beads cost 5p and small beads cost 4p

Rosie has 79p to spend on beads.

4p   5p

How many different combinations of small and large beads can Rosie buy?

Can you write expressions that show all the solutions?

Answers can be found on the next page.

ANSWER SHEET

1) $ab + b = 18$

Mo says,

> a and b must both be odd numbers

Is Mo correct?
Explain your answer.

Possible answer:

Mo is incorrect. Children may give examples to prove Mo is correct e.g. if $a = 5$ and $b = 3$, but there are also examples to show he is incorrect e.g. $a = 2$ and $b = 6$ where a and b are both even.

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2) Large beads cost 5p and small beads cost 4p

Rosie has 79p to spend on beads.

4p   5p

How many different combinations of small and large beads can Rosie buy?

Can you write expressions that show all the solutions?

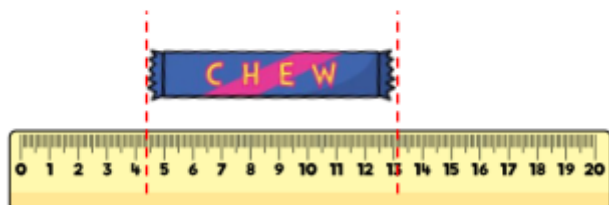Possible answers:

$3l + 16s$
$7l + 11s$
$11l + 6s$
$15l + s$

11.02.21 Metric Measures

## Reasoning and problem solving—Maths extension

Answer and reason the questions below to deepen your mathematical understanding. Once complete, self-mark using the answer sheet.

1) Teddy thinks his chew bar is 13.2 cm long.

Do you agree? Explain why.

2) Ron's dog is about $\frac{1}{4}$ of the height of the door.
Ron is three times the height of his dog.
Estimate the height of Ron and his dog.
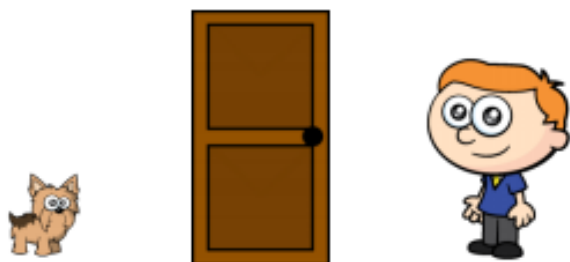
3) Here is a train timetable showing the times of trains travelling from Halifax to Leeds.

Halifax	Leeds
07:33	08:09
07:49	08:37
07:52	08:51

An announcement states all trains will arrive $\frac{3}{4}$ of an hour late.
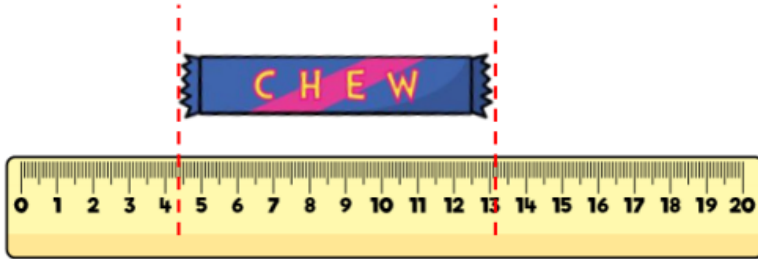Which train will arrive in Leeds closest to 09:07?

Answers can be found on the next page.
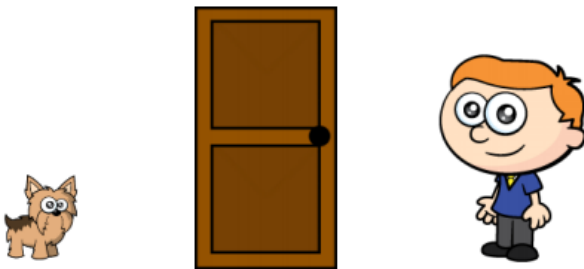
11.02.21 Metric Measures

ANSWER SHEET

1) Teddy thinks his chew bar is 13.2 cm long.

Do you agree? Explain why.

Teddy is wrong because he has not lined up the end of his chew bar with zero.
It is actually 8.8 cm long.

2)

Ron's dog is about $\frac{1}{4}$ of the height of the door.
Ron is three times the height of his dog.
Estimate the height of Ron and his dog.

Door = 2 m (200 cm)
Dog = 50 cm
Ron = 150 cm

3) Here is a train timetable showing the times of trains travelling from Halifax to Leeds.

Halifax	Leeds
07:33	08:09
07:49	08:37
07:52	08:51

An announcement states all trains will arrive $\frac{3}{4}$ of an hour late.
Which train will arrive in Leeds closest to 09:07?

The first train from Halifax, which will now arrive in Leeds at 08:54.