Name: **13+ Mathematics**

Answer all of the questions.

No calculators are allowed.

You must show all necessary working, so that incorrect answers may receive some credit. Try to answer as many questions as you can in the time allowed. Do not worry if you have not been taught the work yet.

1. Work out the difference between the two square numbers in this list of numbers.

6 11 15 21 27 36 48 64

.....

.....

.....

Answer .....

(Total 2 marks)

2. Fill in the missing numbers in these calculations.

(a) $52 + \square = 98$

(1)

(b) $\square \times 9 = 108$

(1)

(c) $\square - 60 = 27$

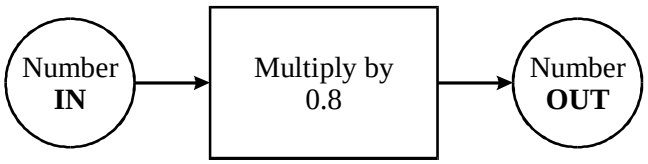
(1)

(d) $450 \div \square = 225$

(1)

(Total 4 marks)

3. (a) Here is a one-stage number machine.



Find the number **IN** when the number **OUT** is 80.

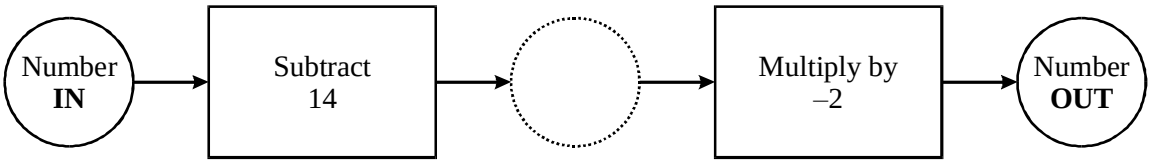
.....

.....

Answer .....

(1)

(b) Here is a two-stage number machine.



Find the number **OUT** when the number **IN** is 10.

.....

.....

Answer .....

(2)

(Total 3 marks)

4. (a) Write the number twenty thousand in figures.

Answer .....

(1)

(b) Write the number 5624

(i) to the nearest 100

Answer .....

(1)

(ii) to the nearest 1000.

Answer .....

(1)

(Total 3 marks)

5. Karl sees this advertisement in a shop window.

HOCKEY KIT

Shirt £16.50

Pair of Shorts £8.50

SPECIAL OFFER!

Buy both items and receive a 10% reduction in price

Karl buys both items.

How much does he pay?

.....

.....

.....

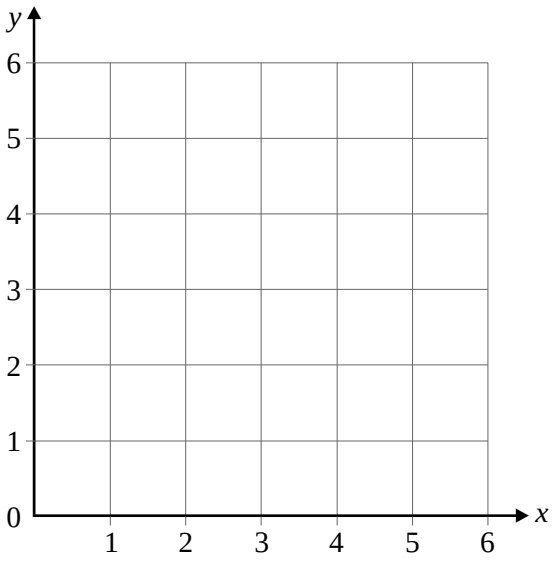
.....

.....

Answer £ ……

(Total 3 marks)

6. (a) On the grid plot the points with coordinates (3, 1), (5, 1) and (4, 4).



(2)

(b) Join the points and give the mathematical name of the shape.

Answer .....

(1)

(Total 3 marks)

7. Work out

(a) 0.4×0.2

.....

Answer .....

(1)

(b) 247×32

.....

.....

.....

.....

.....

.....

Answer .....

(3)

(c) $\frac{1}{6} \times \frac{3}{5}$

.....

.....

Answer .....

(1)

(d) 2% of 500

……

……

……

Answer .....

(2)

(e) $966 \div 42$

.....

.....

.....

.....

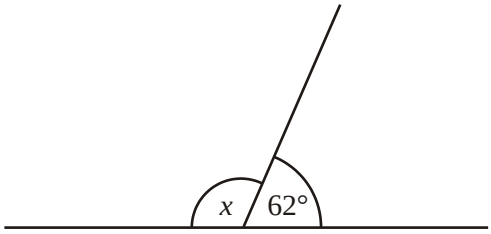
.....

Answer …….....

(2)

(**Total 9 marks**)

8. (a)



Not drawn accurately

(i) Which of these words describes angle *x* ?

acute alternate obtuse opposite reflex right angle

Answer .....

(1)

(ii) Calculate the value of *x*.

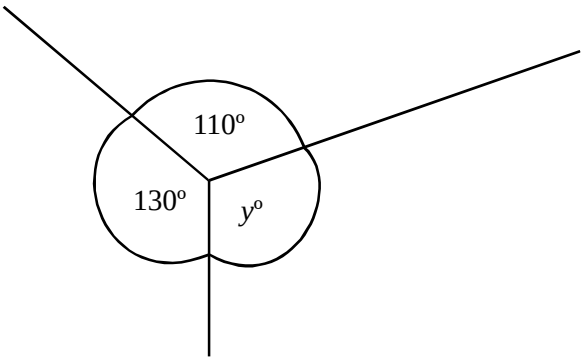
.....

.....

Answer ..... degrees

(2)

(b) The diagram shows 3 angles meeting at point.



Not drawn accurately

Work out the value of y.

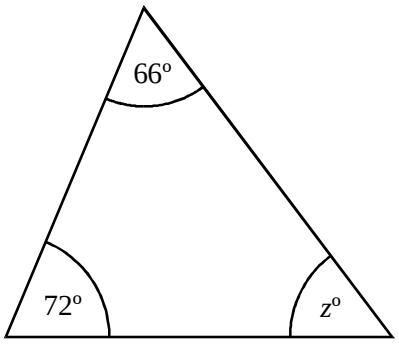
.....

.....

Answer ..... degrees

(2)

(c)



Not drawn accurately

Work out the value of z.

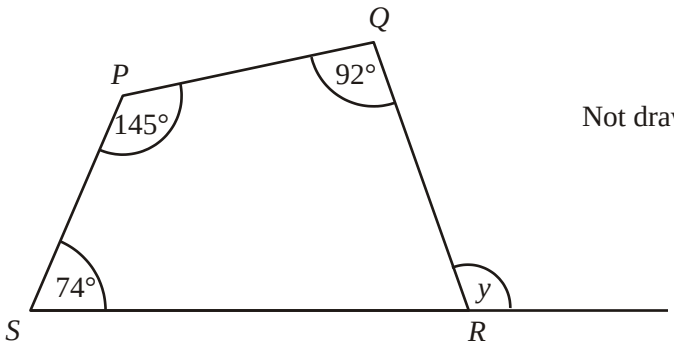
.....

.....

Answer ..... degrees

(2)

(d) The diagram shows a quadrilateral *PQRS*.
Angle $P = 145°$, angle $Q = 92°$ and angle $S = 74°$.



Not drawn accurately

Calculate the value of the exterior angle at *R*, marked *y* on the diagram.

.....

.....

.....

.....

Answer ..... degrees

(4)

(Total 11 marks)

9. Part of a railway timetable is shown.

London Waterloo	1630	1645	1715	1745	1830	1850
Southampton	1739	1810	1825	1859	1940	2018
Bournemouth	1812	1831	1856	1929	2011	2101
Poole	1825	1905	1907	1942	2023	2116
Weymouth	1913	–	1953	2028	2111	–

Sari arrives at London Waterloo at 1720.
She catches the next train from London Waterloo to Bournemouth.

How long does the journey take?

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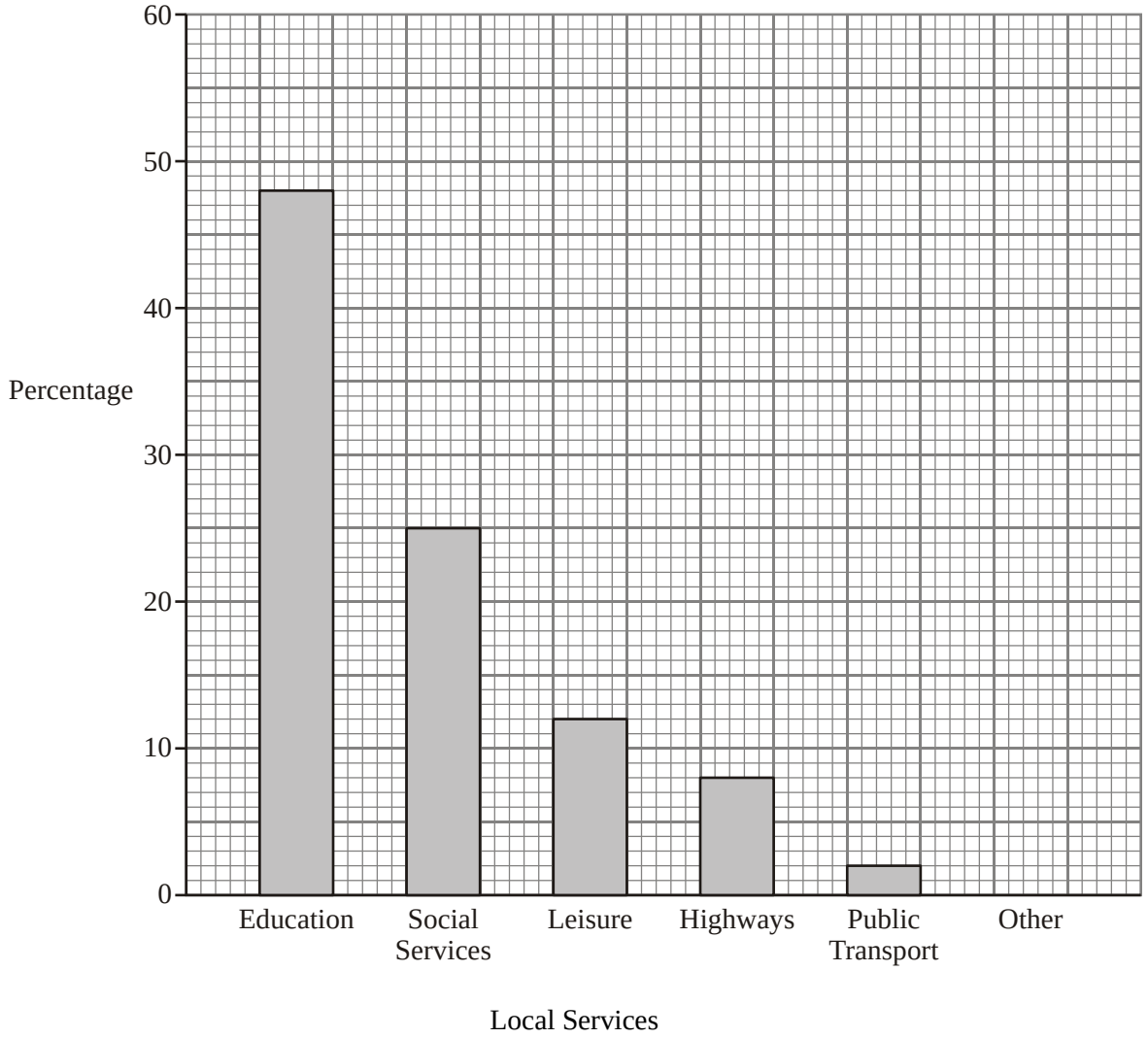
.....

Answer ..... hour ..... minutes

(Total 3 marks)

10. The bar chart shows the percentages spent by a council on local services.



(a) What percentage is spent on Leisure?

Answer ..... %

(1)

(b) Which service has most spent on it?

Answer .....

(1)

(c) Complete the bar chart for Other.

.....

.....

(2)

(Total 4 marks)

11. Simplify the following

(a) $3x + 2x - x$

.....

Answer .....

(1)

(b) $5x + 3y - 2x + 4y$

.....

Answer .....

(2)

(c) $3 \times a \times 4$

.....

Answer .....

(1)

(Total 4 marks)

12. Solve the equations.

(a) $7x = 21$

.....

Answer x = ...

(1)

(b) $3z - 1 = 17$

.....

.....

Answer z = ...

(2)

(c) $5t + 4 = 40 - 2t$

.....

.....

.....

.....

Answer t = ...

(3)

(d) $4(x-5)=2(x+3)$

.....

.....

.....

[3]

(**Total 9 marks**)

13. (a) Use the formula $a = 5b + 2c$ to work out a when $b = 5$ and $c = -4$

.....

.....

Answer .....

(2)

(b) Use the formula $a = 5b + 2c$ to work out c when $a = 16$ and $b = -2$

.....

.....

Answer .....

(2)

(c) (i) Use the formula $y = 5x + 2$ to work out the value of y when $x = -3$

.....

.....

Answer y = ...

(2)

(ii) Use the formula $y = 5x + 2$ to work out the value of x when $y = 32$

.....

.....

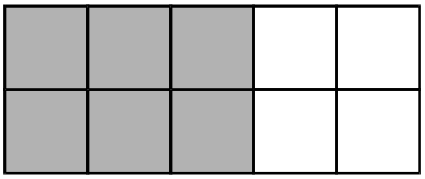
.....

Answer x = ...

(2)

(**Total 8 marks)**

14. (a) What fraction of this shape is shaded?
Give your answer in its simplest form.



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Answer .....

(1)

(b) Find $\frac{7}{10}$ of £50

.....

.....

Answer £ .....

(1)

(c) Find 30% of 200 metres.

.....

.....

Answer ..... metres

(2)

(d) Work out $\frac{1}{2} + \frac{1}{5}$

.....

.....

.....

Answer .....

(2)

(Total 6 marks)

15. (a) A sequence of numbers begins 40, 37, 34, 31,.....

(i) What is the next number in the sequence?

.....

Answer .....

(1)

(ii) Describe in words the rule for continuing the sequence.

.....

.....

(1)

(b) The rule for another sequence is

Next number = Multiply the previous number by 3 then subtract 3

(i) A sequence begins 2, 3, 6, 15, ...

What is the next number in the sequence?

.....

.....

Answer .....

(1)

(ii) Another sequence, using the same rule, starts with 4.
What is the next number in this sequence?

.....

.....

Answer .....

(1)

(iii) Another sequence, using the same rule, starts with –6.
What is the next number in this sequence?

.....

.....

Answer .....

(1)
(Total 5 marks)

16. The table shows the highest and lowest temperatures recorded in five cities.

	Birmingham	**Edinburgh**	**London**	**Manchester**	**Newcastle**
Highest temperature	27°C	25°C	31°C	29°C	26°C
Lowest temperature	–2°C	–7°C	1°C	–2°C	–5°C

(a) Which city recorded the biggest difference between its highest and lowest temperatures?

.....

.....

Answer .....

(1)

(b) The difference between the highest and lowest temperatures is the same for two cities.
Write down the names of these two cities.

.....

.....

.....

Answer.....and.....

(1)
(Total 2 marks)

17. A bag contains 12 blue and 8 green counters.
A counter is chosen at random.

(a) Find the probability that the counter chosen is red.

.....

.....

Answer .....

(1)

(b) Find the probability that the counter chosen is green.
Give your answer as a fraction in its lowest terms.

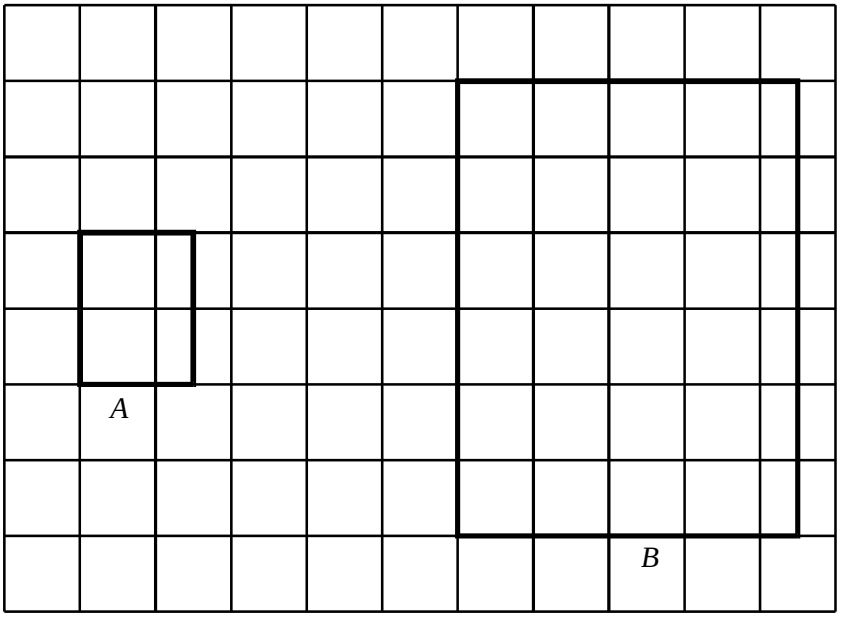
.....

.....

Answer .....

(2)
(Total 3 marks)

18. Rectangle *A* is enlarged to give rectangle *B* on the centimetre grid.



(a) What is the scale factor of the enlargement?

.....

Answer .....

(1)

(b) Draw all the lines of symmetry of rectangle *B*.

(2)

(c) **Rectangle *B*** is enlarged by scale factor 5 to give rectangle *C*.
Write down the length and width of rectangle *C*.

.....

.....

Answer Length ..... cm

Width ..... cm

(3)
(Total 6 marks)

19. Yasmin worked for $4\frac{1}{2}$ hours each day.

In one week she worked 6 days and was paid £10 per hour.

How much did Yasmin earn in that week?

.....

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.....

.....

Answer £ …….

(Total 2 marks)

Total 90 Marks