Maths GCSE
Langdon Park
Foundation Calculator pack A

Name: _____

Class: _____

Date: _____

Time: **96 minutes**

Marks: **89 marks**

Comments:

Q1.

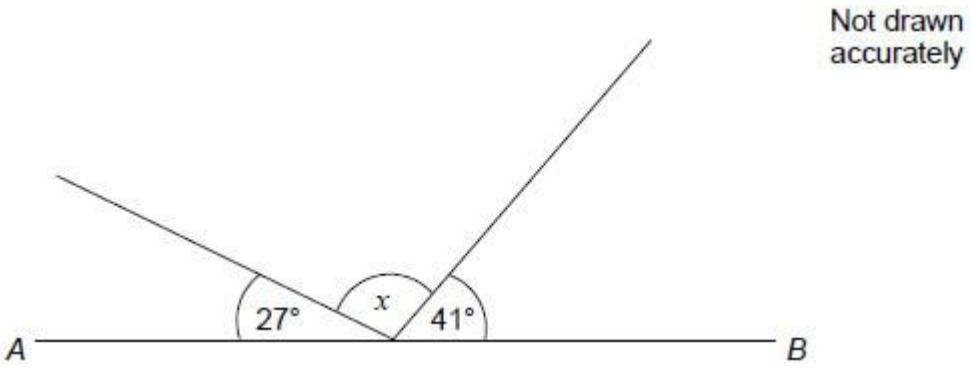
The table shows how 25 students travel to school.

Walk	Bus	Car	Taxi
9	8	7	1

Draw a bar chart to show this information.

(Total 4 marks)

Q2.



AB is a straight line. Work out the size of angle *x*

_____

_____

Answer _____degrees **(Total 2 marks)**

Q3.

Solve $12x = 3$

Circle your answer.

$x = -9$ $x = \frac{1}{4}$ $x = 4$ $x = 36$

(Total 1 mark)

Q4.

Solve $x - 7 = 56$

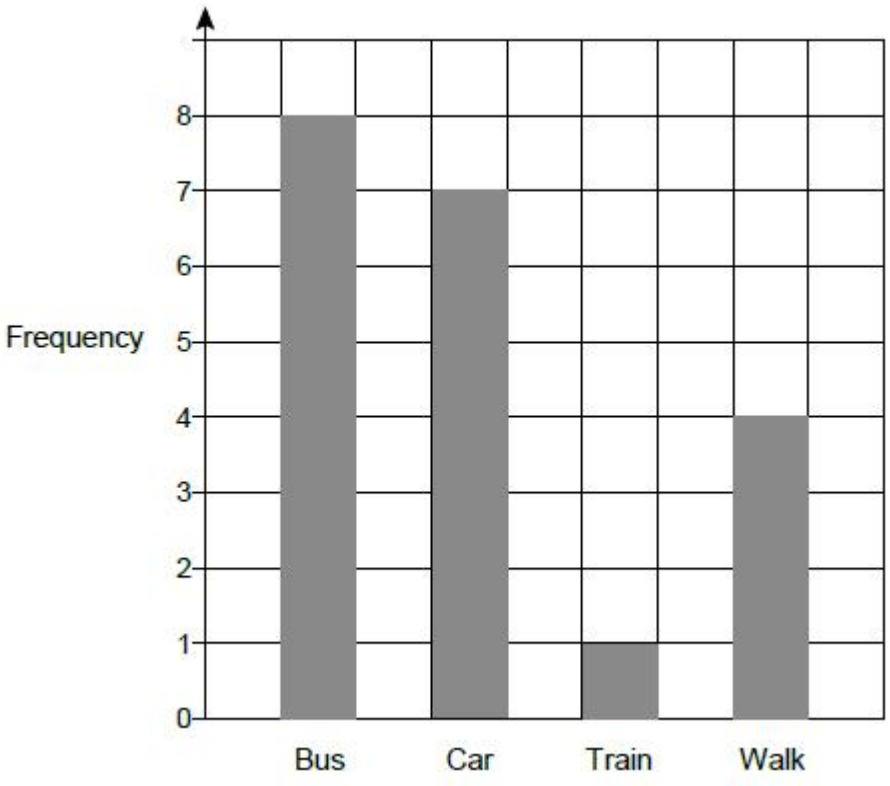
Circle your answer.

$x = 8$ $x = 49$ $x = 56$ $x = 63$

(Total 1 mark)

Q5.

The bar chart shows information about how 20 students travel to school.



Show the information in a pictogram.

Use the key given.

Key : ◯ represents 2 students

Bus	
Car	
Train	
Walk	

(Total 3 marks)

Q6.

The diagram shows a sequence of patterns.

Pattern 1 Pattern 2 Pattern 3 Pattern 4

(a) Work out the number of circles in Pattern 6

_____

_____

Answer _____

(1)

(b) Complete the rule below.

Number of circles = Pattern number × ☐ + ☐

(1)

(c) Which Pattern number has 51 circles?

_____

_____

Pattern _____

(1)

(Total 3 marks)

Q7.

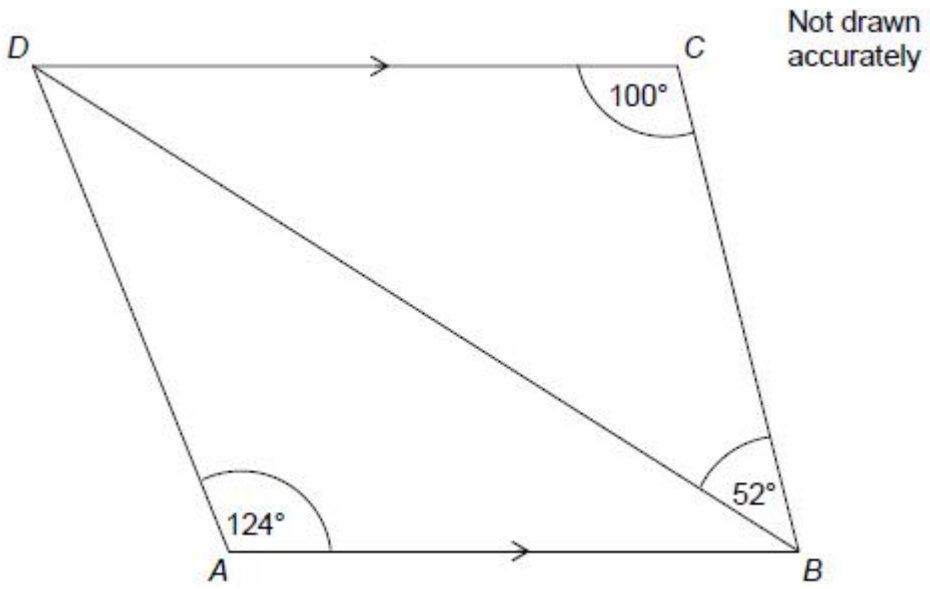
Simplify fully $(8x^3 y^5)^2$

Answer _____

(Total 2 marks)

Q8.

In the diagram, *DC* is parallel to *AB*.

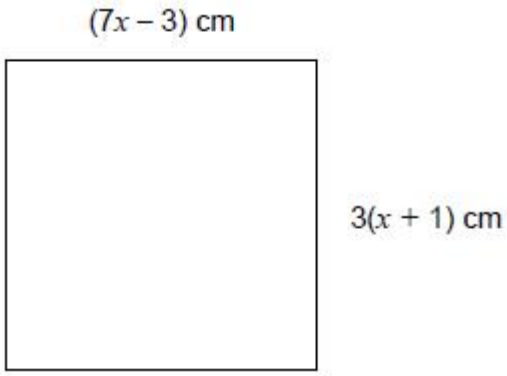


Show that triangle *ABD* is isosceles.

(Total 3 marks)

Q9.

The diagram shows a square.



Work out the length of one side of the square.

Answer _____ cm

(Total 4 marks)

Q10.

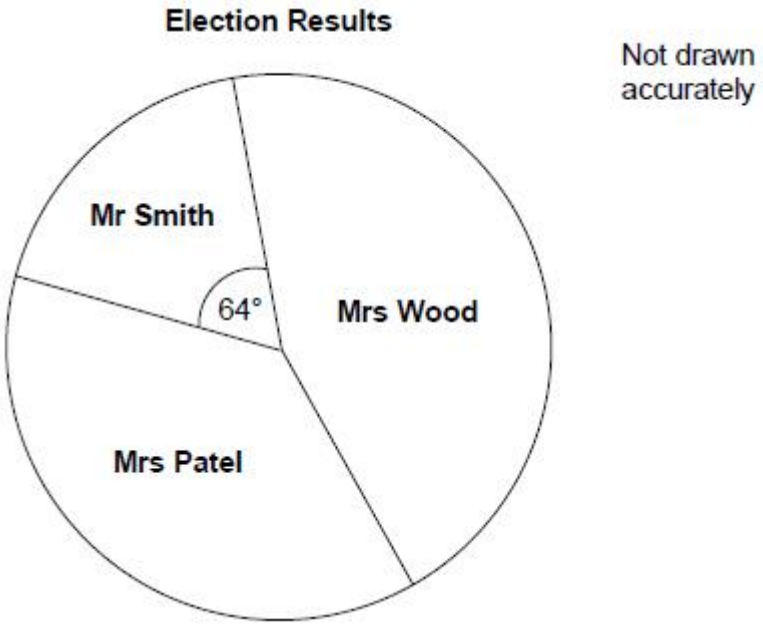
Work out 258% of 6300

Answer _____

(Total 2 marks)

Q11.

The pie chart shows some information about the share of votes for candidates in an election.



The angle for Mrs Wood would be 24° more than the angle for Mrs Patel.
There were 5220 votes in total.

Work out the number of votes for Mrs Patel.

Answer _____

(Total 4 marks)

Q12.

x = 2500 to the nearest 100

Circle the smallest possible value of x.

2449 2450 2495 2499

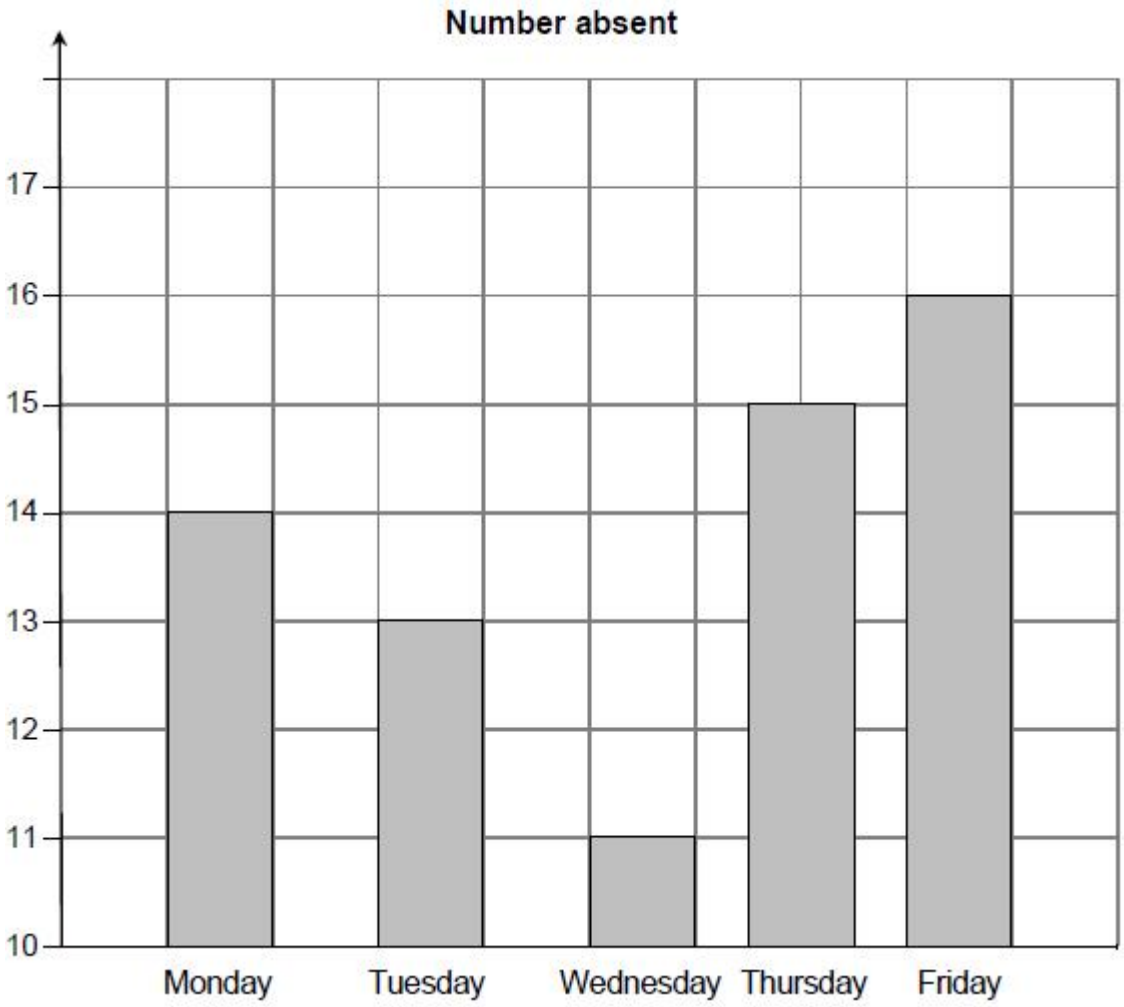
(Total 1 mark)

Q13.

The table shows the number of Year 11 students who were absent in one week.

	Monday	Tuesday	Wednesday	Thursday	Friday
Number absent	14	13	11	15	16

Jack uses this information to draw a bar chart.



Write down **two** mistakes that he has made.

Mistake 1 _____

_____

Mistake 2 _____

_____

(Total 2 marks)

Q14.

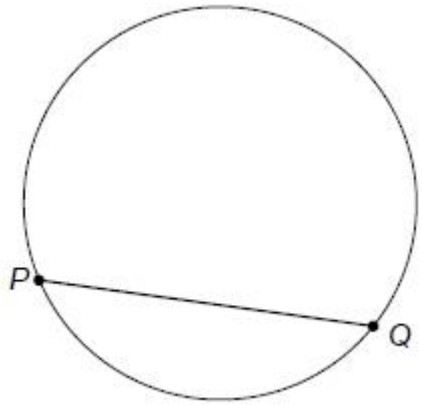
Write 280 as a product of its prime factors.

Answer _____

(Total 2 marks)

Q15.

Circle the word that describes the straight line PQ.



chord diameter radius tangent

(Total 1 mark)

Q16.

Work out the equation of the line that

is parallel to the line $y = 5x - 3$
passes through $(-2, -4)$

_____

_____

_____

_____

Answer _____

(Total 3 marks)

Q17.

Sophie sells birthday cards.

She adds 30% profit to the cost price.
She sells the cards for £2.34 each.
She wants to increase her profit to 40% of the cost price.

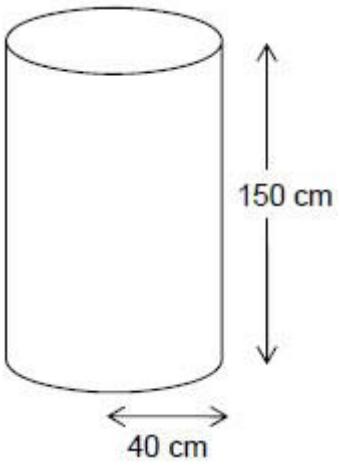
How much should she sell each card for?

Answer £ _____

(Total 3 marks)

Q18.

A water tank is a cylinder with radius 40 cm and depth 150 cm



It is filled at the rate of 0.2 litres per second.
1 litre = 1000 cm^3

Does it take longer than 1 hour to fill the tank?
You **must** show your working.

Answer _____

(Total 4 marks)

Q19.

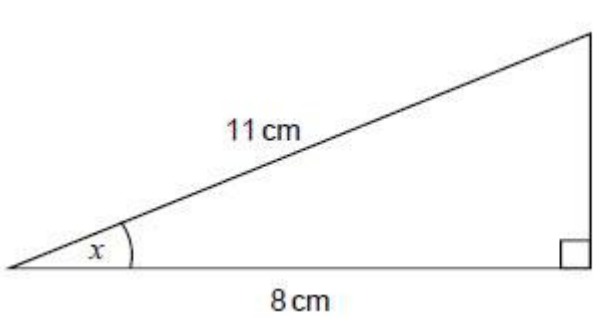
Expand and simplify $(y + 5)(y - 4)$

Answer _____

(Total 2 marks)

Q20.

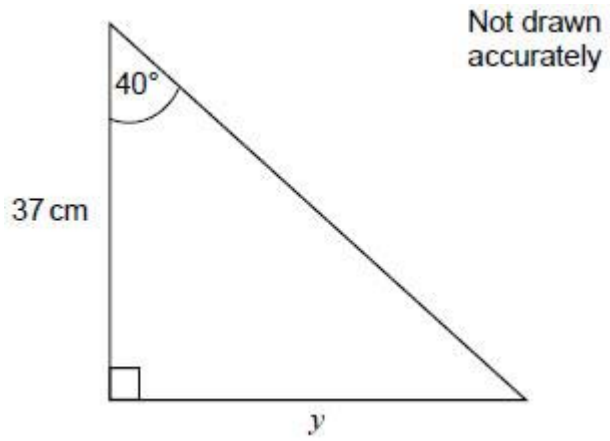
(a) Work out the size of angle x.



Answer _____ degrees

(2)

(b) Work out length y.



Answer _____ cm

(2)

(Total 4 marks)

Q21.

The table shows information about journeys A and B.

Complete the table.

	Distance travelled	Time taken	Average speed
A	32 miles		64 mph
B		1 hour 20 minutes	42 mph

(Total 2 marks)

Q22.

The times that 80 customers waited at a supermarket checkout are shown.

Time, t (minutes)	Frequency
$0 \leq t < 2$	32
$2 \leq t < 4$	19
$4 \leq t < 6$	20
$6 \leq t < 8$	7
$8 \leq t < 10$	2

(a) In which class interval is the median?

Circle your answer.

$0 \leq t < 2$ $2 \leq t < 4$ $4 \leq t < 6$ $6 \leq t < 8$

(1)

(b) The manager of the supermarket says,

"90% of our customers wait less than 6 minutes."

Does the data support this statement?
You **must** show your working.

_____

_____

_____

_____

Answer _____

(1)

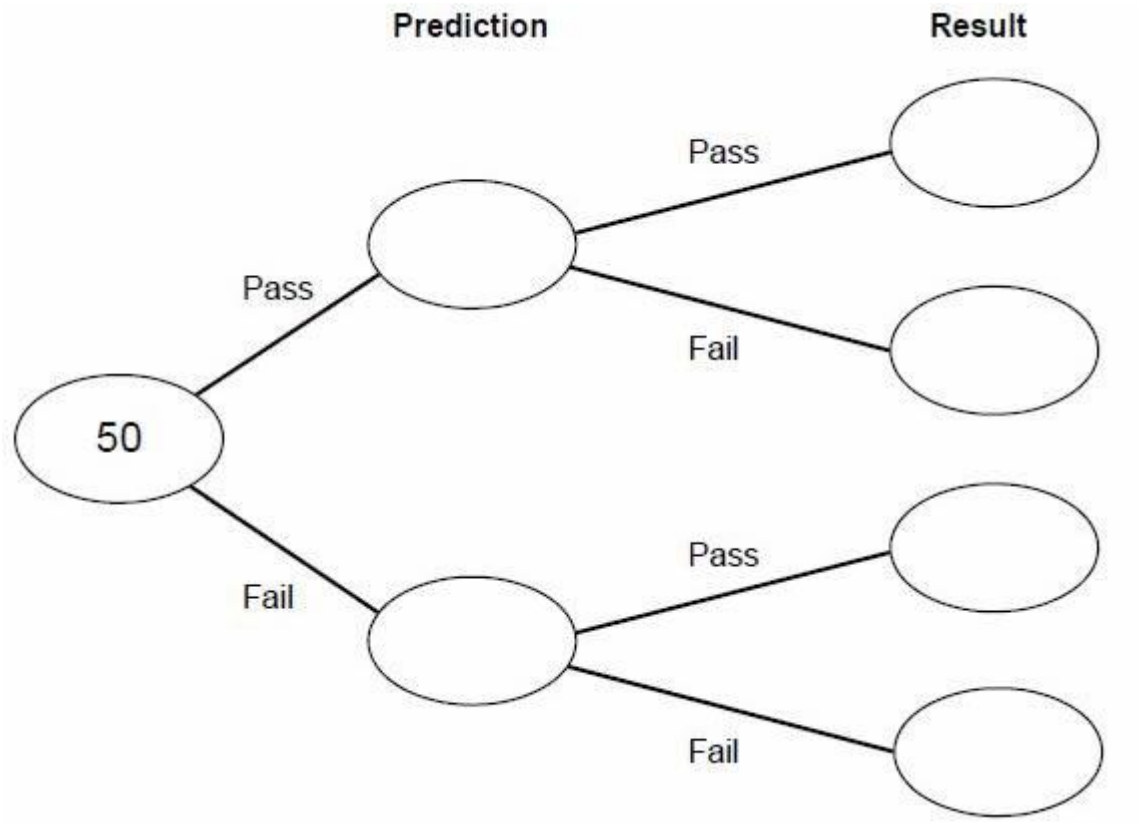
(Total 2 marks)

Q23.

50 people took a test.
Before the test, they predicted whether they would pass or fail.

30 people predicted they would pass.
26 of the people who predicted they would pass did pass.
37 people passed altogether.

Complete the frequency tree.



(Total 2 marks)

Q24.

Three whole numbers have a total of 100
The first number is a multiple of 15
The second number is ten times the third number.

Work out the three numbers.

Answer _____ , _____ , _____

(Total 3 marks)

Q25.

Increase 4200 by 38%

Answer _____

(Total 2 marks)

Q26.

I am thinking of a prime number.
Its digits add up to a square number.

Write down a prime number that I could be thinking of.

Answer _____

(Total 2 marks)

Q27.

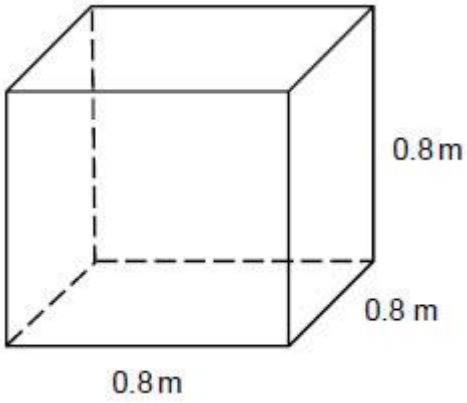
Write down all the factors of 18

Answer _____

(Total 2 marks)

Q28.

A cube has edges of length 0.8 metres.



Work out its volume in **cubic centimetres**.

_____

_____

_____

_____

Answer _____ cm^3

(Total 2 marks)

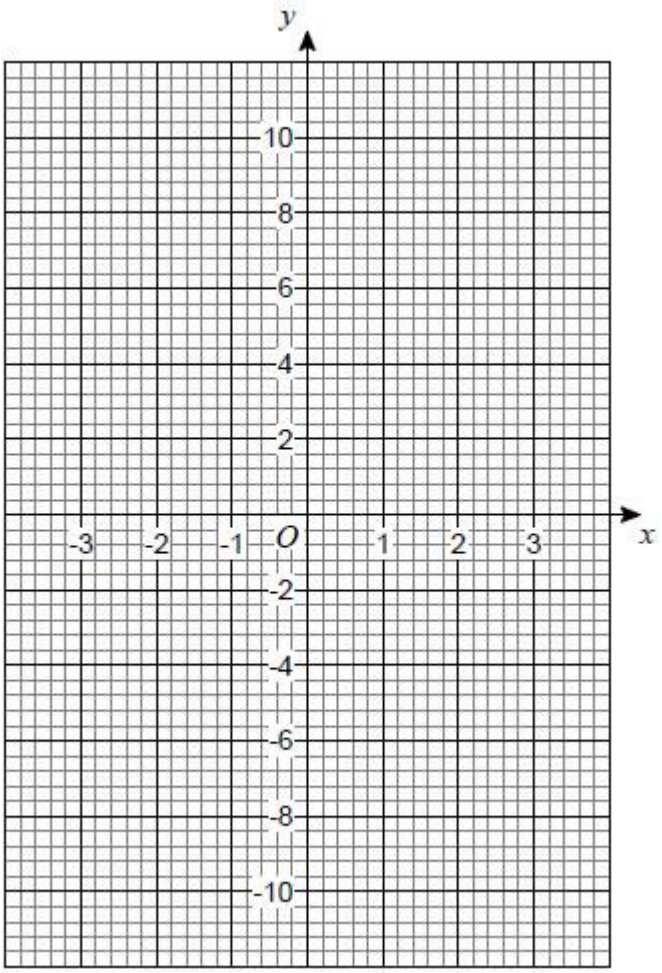
Q29.

(a) Complete the table for $y = 3x + 1$

x	−3	−2	−1	0	1	2	3
y	−8		−2		4		

(2)

(b) On the grid draw the graph of $y = 3x + 1$ for values of x from −3 to 3



(2)

(c) Solve $x = 3x + 1$

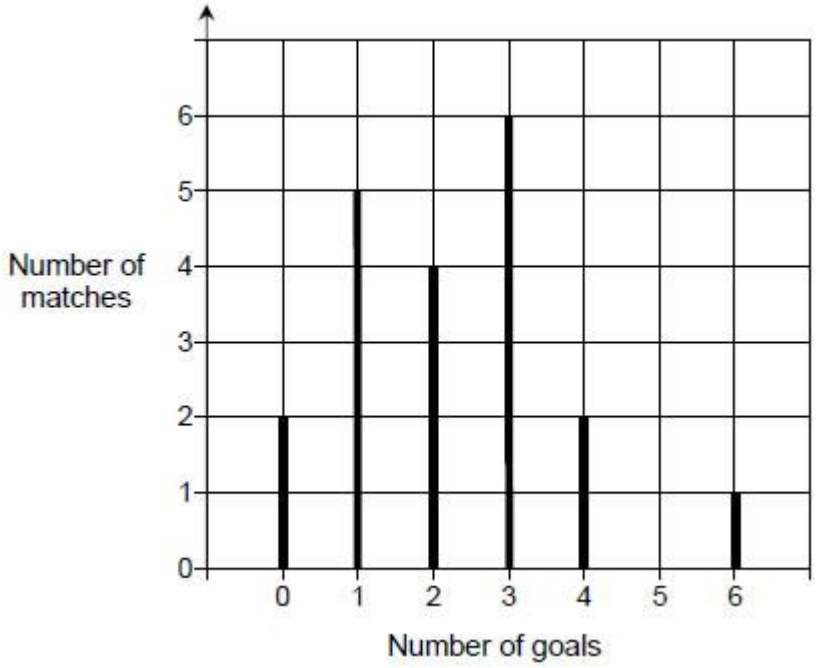
$x =$ _____

(2)

(Total 6 marks)

Q30.

The line graph shows the number of goals scored by a hockey team.



(a) Which number of goals is the mode?

Answer _____

(1)

(b) How many matches did the hockey team play altogether?

_____

_____

_____

Answer _____

(2)

(c) In one of the matches, this team won by 5 goals.

What was the score in that match?

Answer _____

(1)

(Total 4 marks)

Q31.

Solve $4x - 5 = 17$

_____

_____

_____

$x =$ _____

(Total 2 marks)

Q32.

What is the value of the digit 7 in 3.72?

Circle your answer.

$\frac{1}{70}$ $\frac{7}{10}$ $\frac{1}{7}$ $\frac{7}{100}$

(Total 1 mark)

Q33.

Diaries are sold in boxes of 12
Pencils are sold in boxes of 10
Rulers are sold in boxes of 6

A teacher wants to buy the same number of diaries, pencils and rulers.

Work out the **smallest** number of boxes of each item he could buy.

_____

_____

_____

_____

_____

_____

_____boxes of diaries

_____boxes of pencils

_____boxes of rulers

(Total 3 marks)

Q34.

Here is a sequence.

40 35 30 25 20

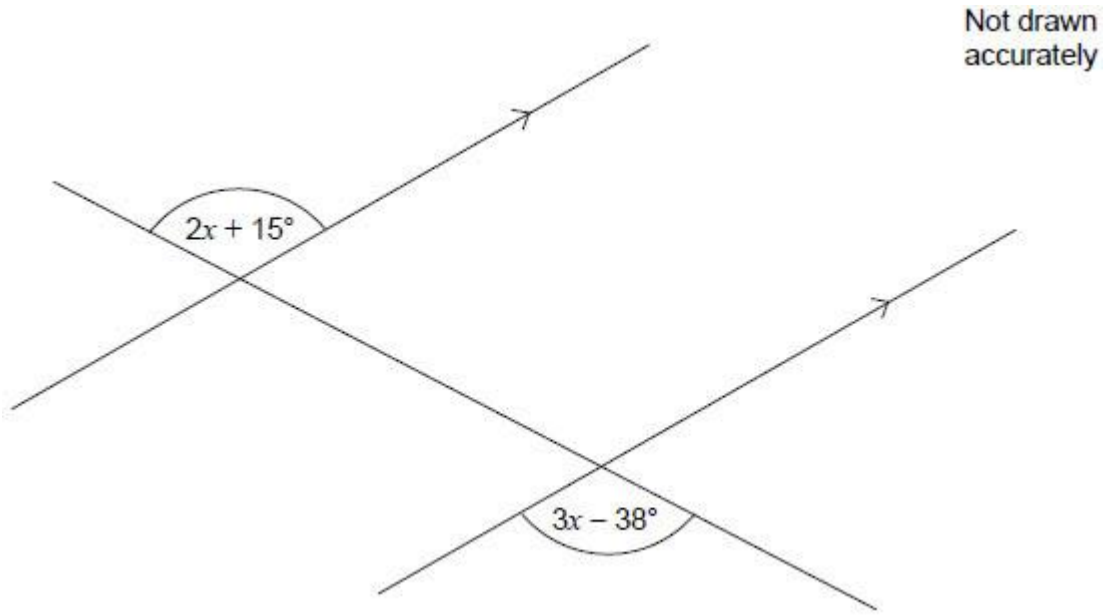
Circle the expression for the nth term of the sequence.

$5n + 35$ $5n - 45$ $45 - 5n$ $n - 5$

(Total 1 mark)

Q35.

Three straight lines are shown.



Work out the value of x.

Answer _____

(Total 3 marks)

Mark schemes

Q1.

Linear scale from zero used for frequency

B1

Bars at correct heights and equal widths with equal gaps

B1

Bars labelled

B1

Vertical axis labelled

eg Number of students, frequency

Vertical axis can be horizontal for a horizontal bar chart

B1

[4]

Q2.

180 − 27 − 41

M1

oe

112

A1

[2]

Q3.

$x = \frac{1}{4}$

B1

[1]

Q4.

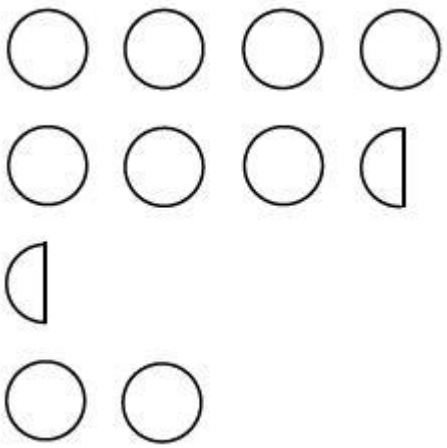
$x = 63$

B1

[1]

Q5.

Fully correct with circles left aligned



B2 for 3 rows correct

B1 for 1 or 2 rows correct

SC1 for pictogram with symbols in correct ratio

eg 8 circles on 1st row, 7 circles on 2nd row, 1 circle on 3rd row and 4 circles on 4th row

B3

Additional Guidance

Accept D for half circle

[3]

Q6.

(a) 13

B1

(b) × 2 + 1

B1

(c) 25

B1

[3]

Q7.

$64x^6y^{10}$

B1 for two terms correct

B2

[2]

Q8.

$\angle CDB = 180 - 52 - 100$ or 28

or $\angle ABD = 180 - 52 - 100$ or 28

oe

M1

$\angle ADB = 180 - 124 -$ their 28

$= 28$

oe

M1dep

$\angle ABD = 28$ and $\angle ADB = 28$

and isosceles or two angles equal

A1

[3]

Q9.

$7x - 3 = 3x + 3$

B1

$7x - 3x = 3 + 3$

or $4x = 6$

oe isolating x and number terms

M1

$x = 1.5$

A1

7.5 or $7\frac{1}{2}$

ft 7 × their 1.5 − 3
or 3(their 1.5 + 1)

B1ft

[4]

Q10.

Alternative method 1

6300 × 2.58

oe

M1

16254

A1

Alternative method 2

Fully correct build up method

eg 100% = 6300
and 50% = 6300 ÷ 2 or 3150
and 1% = 6300 ÷ 100 or 63
and
2 × 6300 + their 3150 + 8 × their 63

M1

16254

A1

[2]

Q11.

Alternative method 1

$64 + x + x + 24 = 360$

oe

M1

$2x = 360 - 24 - 64$

or $x = 136$

M1

their $\frac{136}{360}$ x 5220

oe

M1

1972

A1

Alternative method 2

360 − 64 or 296

M1

$\frac{296 - 24}{2}$ or 136

oe

M1

their $\frac{136}{360}$ *x* 5220

oe

M1

1972

A1

[4]

Q12.

2450

B1

[1]

Q13.

Any two from:

(Vertical scale) does not start at 0 or incorrect height bars or vertical scale is incorrect

Gaps (between bars not equal)

No label(s) (on vertical scale)
(frequency)

oe

Any order

B1 for one correct

B2

[2]

Q14.

2 (×) 140 or 5 (×) 56 or 7 (×) 40

oe Correct product with at least one prime factor

M1

2 × 2 × 2 × 5 × 7

oe

A1

[2]

Q15.

chord

B1

[1]

Q16.

Gradient is 5

Implied by $y = 5x...$

B1

their $5 \times -2 + c = -4$

M1

$y = 5x + 6$ or $5x - y + 6 = 0$
or $y - 5x - 6 = 0$

ft their gradient

A1 ft

[3]

Q17.

130% = £2.34
or 2.34×1.3
or (£)1.8(0)

oe

M1

their (£)1.8(0) × 1.4

M1dep

2.52

A1

[3]

Q18.

$\pi \times 40^2 \times 150$

753982 or 240000π
[753600, 754080]

M1

their 753 982 ÷ 1000
or their 753982 ÷ 1000 ÷ 0.2

753.982 or 240π
[753.600, 754.080]
3770
[3768, 3770.4]

M1

their 3770 ÷ 60 (÷ 60)
or (60 × 60 =) 3600
or 0.2 × 60 × 60 or 720

62.83… or 1.04…
[62.8, 62.84] or [1.04, 1.05]

M1dep

[62.8, 62.84] and Yes
or
[1.04, 1.05] and Yes

or
3600 and 3770 and Yes
or
753.9 and 720 and Yes
oe

A1

[4]

Q19.

$y^2 - 4y + 5y - 20$

Allow 1 error

M1

$y^2 + y - 20$

A1

[2]

Q20.

(a) cos $x = \frac{8}{11}$

or sin $x = \frac{\sqrt{11^2 - 8^2}}{11}$

or tan $x = \frac{\sqrt{11^2 - 8^2}}{8}$

oe

M1

43(.3….)

A1

(b) tan 40 = $\frac{y}{37}$ or tan 50 = $\frac{37}{y}$

oe

$x = 48.3\ldots$ and $37^2 + y^2 = 48.3^2$

48.3 cos 50 or 48.3 sin 40

M1

31. (…)

A1

[4]

Q21.

30 minutes or $\frac{1}{2}$ hour

oe

B1

56 (miles)

B1

[2]

Q22.

(a) $2 \leq t < 4$

(b) **Alternative method 1**

B1

32 + 19 + 20 or 71 and 80 × 0.9
or
(32 + 19 + 20) ÷ 80 × 100 or 88.75
oe

M1

71 and 72 and No
or
88(.75)(%) or 89(%) and No
Accept 88(.75)(%) and Yes because it rounds to 90

A1

Alternative method 2

7 + 2 or 9 and 80 × 0.1
or
(7 + 2) ÷ 80 × 100 or 11.25
oe

M1

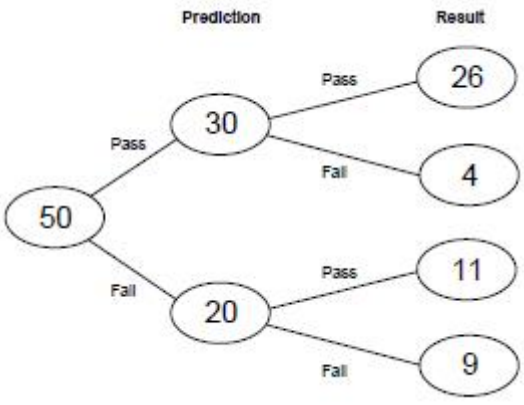
9 and 8 and No
or
11(.25)(%) or 12(%) and No

A1

[3]

Q23.

Fully correct



B1 20 and 11 in correct positions

B2

[2]

Q24.

45 50 5

Any order
B2 three numbers with two of these criteria

• *a multiple of 15*
• *two numbers in the ratio 10: 1*
• *sum of 100*

B1 a multiple of 15
or two numbers in the ratio 10:1
or three numbers with a sum of 100

B3

[3]

Q25.

Alternative method 1

4200 × 0.38 or 1596

1.38 seen

M1

5796

A1

Alternative method 2

4200 ÷ 10 × 3 + 4200 ÷ 10 ÷ 2 + 4200 ÷ 100 × 3
or 1596

M1

5796

A1

Alternative method 3

4200 ÷ 10 × 4 × 4200 ÷ 100 × 2

M1

or 1596

A1

[2]

Q26.

13 or 31 or 79 or 97 or 103 or any other prime whose digits add up to a square number

B1 any prime of 2 or more digits
B1 any number of 2 or more digits whose digits add up to a square number

B2

[2]

Q27.

1, 2, 3, 6, 9 and 18

B1 for 4 or 5 correct (and 1 incorrect)

B2

[2]

Q28.

0.8^3 or 0.512
or 80 × 80 × 80

oe

M1

512000

A1

[2]

Q29.

(a) −5 1 7 10

B1 for 2 or 3 correct

B2

(b) At least 2 of their points correctly plotted

M1

Straight ruled line drawn from (−3, −8) to (3, 10)

A1

(c) Draws the line $y = x$ on the grid or $-2x = 1$ or $-1 = 2x$

oe

M1

$-\frac{1}{2}$

oe

A1

[6]

Q30.

(a) 3

B1

(b) 2 + 5 + 4 + 6 + 2 + 1

Allow one error or omission

M1

20

A1

(c) 6 − 1 or 1 − 6

oe

B1

[4]

Q31.

$4x = 5 + 17$ or $4x = 22$

M1

5.5

oe

SC1 3

A1

[2]

Q32.

$\frac{7}{10}$

B1

[1]

Q33.

Alternative method 1

Lists the multiples of two of 12, 10, 6
12, 24, 36… 60…
10, 20, 30… 60…
6, 12, 18… 60…

Writes out all the multiples to at least 60

M1

60

May be implied by correct number of boxes

A1

5
and 6
and 10

ft their multiple of 60

B1ft

Alternative method 2

Lists the prime factors of two of
12, 10, 6
12 = 2 × 2 × 3
10 = 2 × 5
6 = 2 × 3

M1

2 × 2 × 3 × 5

May be implied by correct number of boxes

A1

5
and 6
and 10

ft their multiple of 60

B1ft

[3]

Q34.

45 − 5*n*

B1

[1]

Q35.

$3x - 38 = 2x + 15$

oe

M1

$3x - 2x = 15 + 38$

Collects terms oe

M1dep

53

A1

[3]