



Please write clearly in block capitals.

Centre number

Candidate number

Surname _____

Forename(s) Worked Solutions

Candidate signature _____

Worked Solutions
(non calc paper)

**GCSE
MATHEMATICS**

F

Foundation Tier Paper 1 Non-Calculator

Tuesday 5 November 2019 Morning Time allowed: 1 hour 30 minutes

1 Circle the value of the digit 9 in the number 7.962

[1 mark]

$$\frac{9}{1000}$$

$$\frac{9}{100}$$

$$\frac{9}{10}$$

9

2 Solve $3x = 6$
Circle your answer.

[1 mark]

$$x = 0.5$$

$$x = 2$$

$$x = 3$$

$$x = 18$$

3

Circle the correct statement.

[1 mark]

$$0.3 > \frac{1}{4}$$

$$0.3 = \frac{1}{4}$$

$$0.3 \leq \frac{1}{4}$$

$$0.3 < \frac{1}{4}$$

4

Circle the number that is closest in value to $\sqrt{50}$

[1 mark]

5

7

8

25

5

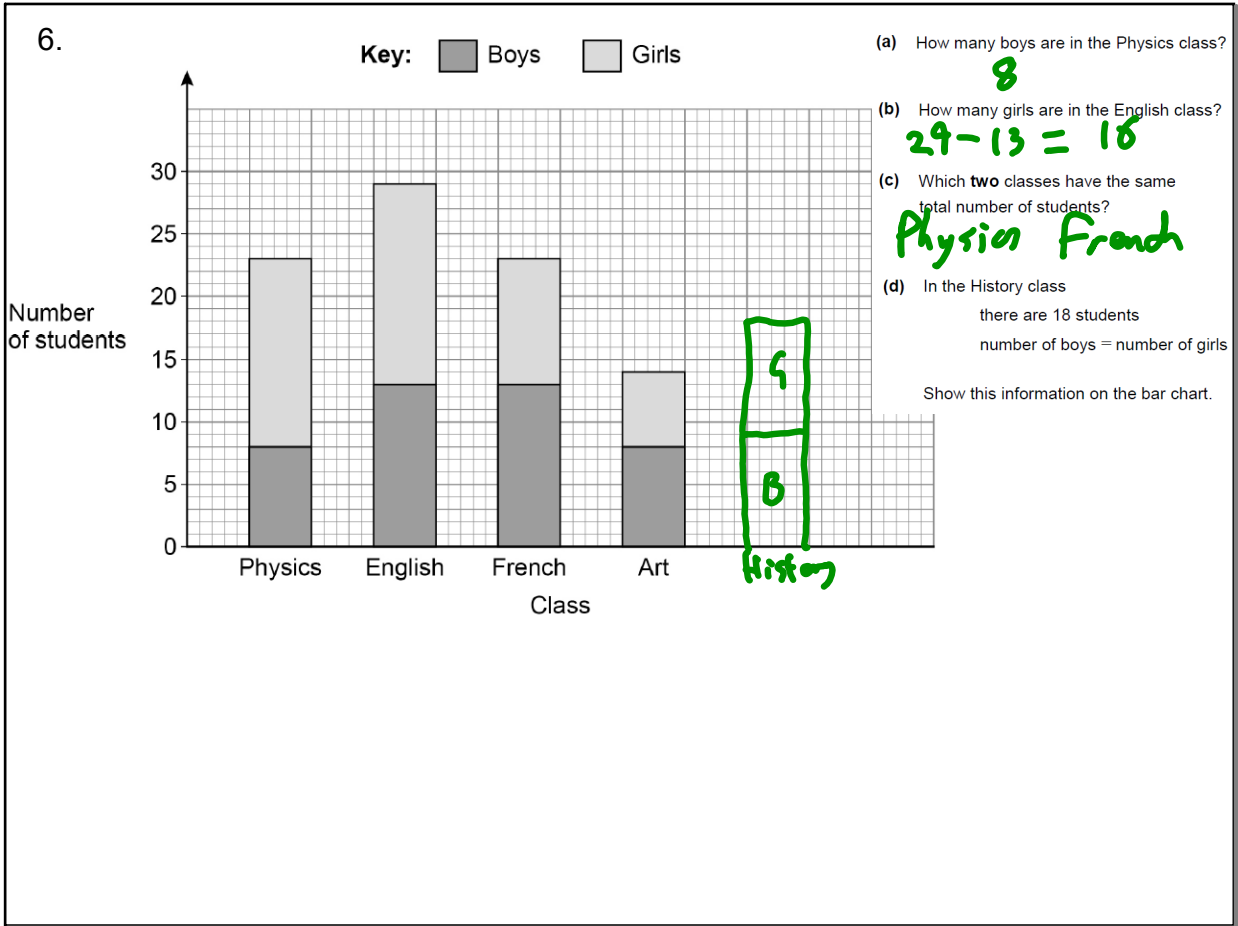
Work out 76×24

[3 marks]

	20	4
70	1400	280
6	120	24

$$\begin{array}{r} 1400 \\ 280 \\ 120 \\ 24 \\ \hline 1824 \end{array}$$

1824



7 (a) Work out $1.86 \div 6$ [1 mark]

0.32

Answer _____

7 (b) Work out 0.4×0.2 [1 mark]

0.08

8 Here are four number cards.

8.6	0.27	6.3	0.4
-----	------	-----	-----

8 (a) Choose **two** of the cards to make the answer to this calculation a whole number.
Include the answer to the calculation.

[2 marks]

$$\boxed{8.6} + \boxed{0.4} = \underline{9}$$

(b) Choose **two** of the cards to make the answer to this calculation as large as possible.
Include the answer to the calculation.

[2 marks]

$$\boxed{8.6} - \boxed{0.27} = \underline{8.33}$$

$$\begin{array}{r} 8.60 \\ - 0.27 \\ \hline 8.33 \end{array}$$

9

Rulers
85p each

Pens
£3.50 each

Jenny buys 5 rulers and 2 pens.
She works out how much she should pay.

Rulers: $5 \times 85 = \pounds 4.25$

Pens $2 \times 3.50 = \pounds 7$

$5 \times 85p = \pounds 4.25$
 $2 \times \pounds 3.50 = \pounds 6.10$
 Total = $\pounds 10.35$

Total = $\pounds 11.25$

Jenny's total is wrong.

she multiplied 350×2

What mistake has she made? *1*

Include the correct total in your answer.

[2 marks]

10 Here are three calculations, A, B and C.

A

$$100 \times 20\,000$$

$$2\,000\,000$$

B

$$1 \text{ million} \div 2$$

$$1\,000\,000 \div 2 = 500\,000$$

C

$$4 \times 100\,000$$

$$400\,000$$

Put the calculations in order.

Start with the calculation that has the smallest answer.

You **must** show the answer to each calculation.

smallest

biggest

[3 marks]

$$400\,000, 500\,000, 2\,000\,000$$

11 In a raffle, 200 tickets are sold.
The tickets are either red or blue.
The winning ticket is picked at random.

11 (a) What is the probability that the winning ticket is green?

[1 mark]

Answer 0 or $\frac{0}{200}$

11 (b) 79 children and 90 women buy one ticket each.
Men buy the rest of the tickets.

$$79 + 90 = 169$$

$$200 - 169 = 31 \text{ (men)}$$

Work out the probability that a man buys the winning ticket.

[2 marks]

$$\frac{31}{200}$$

12 A college has
a total of 105 teachers
19 more female teachers than male teachers.

What proportion of the teachers are female? [3 marks]

$$105 - 19 = 86$$

$$\frac{86}{2} = 43 \text{ male} \quad 43 + 19 = 62 \text{ female}$$

Female proportion is $\frac{62}{105}$

Answer _____

13 By rounding each number to the nearest 10, estimate the value of $262 \div 19.8$ [2 marks]

$$260 \div 20 = \underline{13}$$

Answer _____

14 *ABEF* and *ACDF* are rectangles.
 $AF = 10 \text{ cm}$ $AB = 2 \text{ cm}$ $BC = 4 \text{ cm}$

Not drawn accurately

ABEF Perimeter 10 cm
Work out $= 10 + 2 + 10 + 2 = 24 \text{ cm}$
perimeter *ABEF* : perimeter *ACDF*

Give your answer in its simplest form. [3 marks]

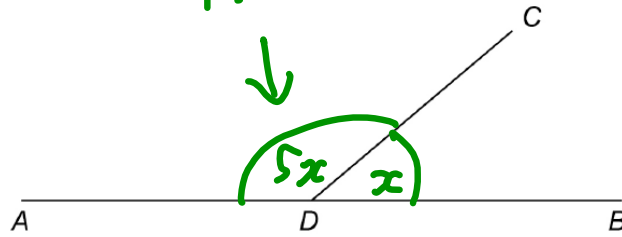
ACDF perimeter $= 10 + 6 + 10 + 6 = 32 \text{ cm}$

ratio $24 : 32$
 $3 : 4$

15

ADB and CD are straight lines.

Find this one



Not drawn accurately

angle $ADC = 5 \times$ angle CDB

Work out the size of angle ADC .

$$\frac{180}{6} = 30 \quad 30 \times 5 = \underline{150^\circ}$$

[3 marks]

16

Circle the value of 5^3

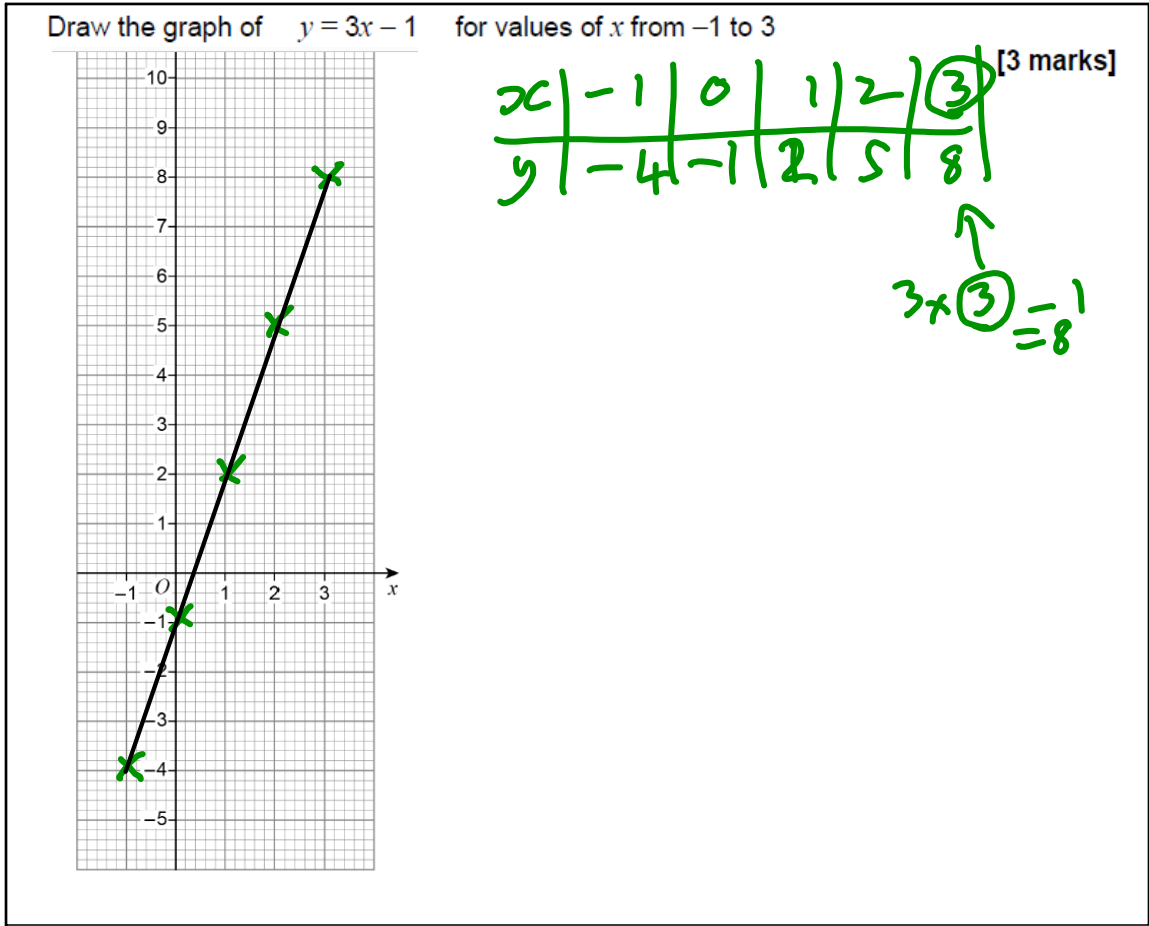
[1 mark]

8

15

25

125



18 Mo played 30 games of chess.
He won 18 of these games.

Lost 12 games

18 (a) What fraction of the games did he win?
Give your answer in its simplest form.

$$\frac{18}{30} \div 6 = \frac{3}{5}$$

[2 marks]

Answer

$$\frac{3}{5}$$

18 (b) He played 20 more games.
He had then won 64% of all of his games.
How many of the 20 games did he win?

[3 marks]

9 (a) In a field

number of sheep : number of cows = 10 : 3

Zak says,

"There are 10 sheep in the field."

Give a reason why Zak **could** be wrong.

There could be 20 sheep and 6 cows

[1 mark]

19 (b) In a different field

number of goats : number of pigs = 13 : 4

Priya says,

"There are more than three times as many goats as pigs."

Is she correct?

Tick **one** box.

Yes

No

Cannot tell

13 is more than 3 x 4 (12)

Show working to support your answer.

[1 mark]

20

An ordinary fair dice is rolled.

$$P(A) = \frac{5}{6}$$

Which could be a correct statement about event A?

Tick **one** box.

[1 mark]

The number rolled is even

The number rolled is greater than 1

The number rolled is less than 5

The number rolled is prime

21

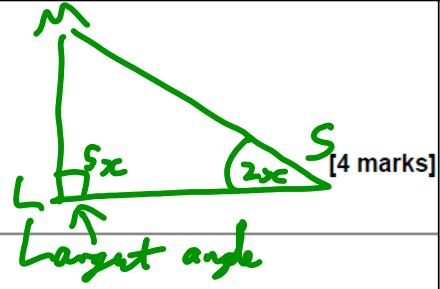
Solve $8x + 7 = 2x + 10$

[3 marks]

$$\begin{array}{l}
 8x + 7 = 2x + 10 \\
 \underline{-2x \quad -2x} \\
 6x + 7 = 10 \\
 \underline{-7 \quad -7} \quad \leftarrow \\
 6x = 3 \\
 \underline{\frac{3}{6} = \frac{1}{2} \text{ or } 0.5}
 \end{array}$$

22

In a right-angled triangle
 smallest angle : largest angle = 2 : 5
 Work out the three angles of the triangle.



$$L \quad \boxed{18 \ 18 \ 18 \ 18 \ 18} = 90$$

$$S \quad \boxed{18 \ 18} = 36^\circ$$

$$S = 36^\circ$$

$$L = 90^\circ$$

$$\frac{90}{5} = 18$$

$$36 + 90 = 126^\circ$$

$$M = 180 - 126 = 54^\circ$$

36°, 54°, 90° degrees

_____ degrees

_____ degrees

23

Which one of the following is discrete data?
 Circle your answer.

[1 mark]

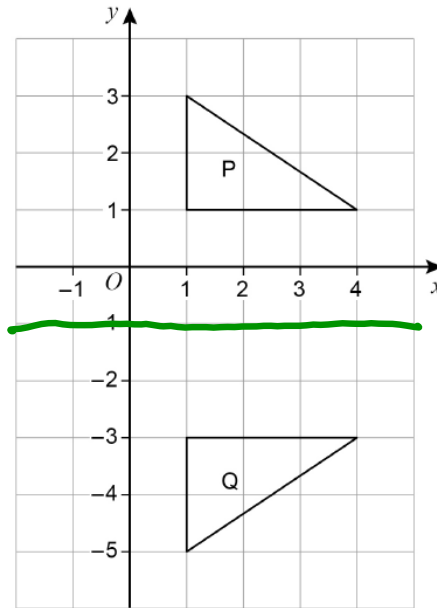
length of arm

height of door

number of pets

mass of sugar

(a) Here are two triangles, P and Q.



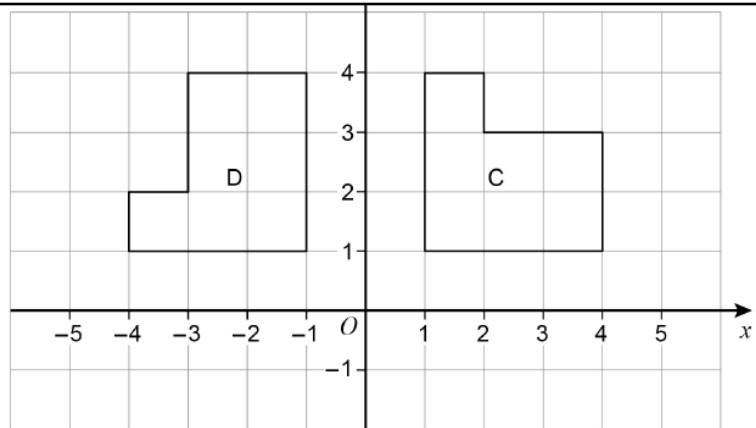
this line is $y = -1$, not $x = -1$

Here is a statement.

A transformation that maps P to Q is a reflection in the line $x = -1$

Make **one** criticism of the statement.

[1 mark]



Here is a statement.

A transformation that maps C to D is a rotation through 90° anticlockwise.

Make **one** criticism of the statement.

They haven't said where the centre of rotation is

[1 mark]

25 (a) A geometric progression starts 4 16
 Work out the next term. *multiply $\rightarrow \times 4 \times 4$* [1 mark]

$16 \times 4 = 64$

Answer 64

25 (b) A Fibonacci-type sequence starts 3 -8 -5
 The sequence is continued by adding the previous two terms.
 Work out the next two terms. [2 marks]

$3 + -8 = -5$
 $-8 + -5 = -13$

Answer -5 and -13

26 Given that $a \times 60 = b$ work out the value of $\frac{4b}{a}$ [2 marks]

$60 = \frac{b}{a}$
 $(\times 4)$
 $240 = \frac{4b}{a}$

Answer 240

27 Write $27 \times (3^2)^7$ as a single power of 3 [3 marks]

$3^3 \times 3^{14} = 3^{17}$

Answer _____

28 Here are two solids.

Cylinder
radius 4 cm height 10 cm

Hemisphere
radius 6 cm

Area → $4 \times 4 \times \pi = 16\pi$
 $V = 16\pi \times 10 = 160\pi$

volume of a hemisphere = $\frac{2}{3}\pi r^3$ where r is the radius

$(6 \times 6 \times 6)$
 $\frac{2}{3} \times \pi \times 6^3$
 $= \frac{2}{3} \times 216 \times \pi$
 $\frac{216}{3} = 72$ $\frac{2}{3} = 144$
 $V = 144\pi$

cylinder is biggest

29 Saj makes Rose Pink paint and Cherry Pink paint.
 He mixes red paint with white paint as shown.

Rose Pink
red : white = 1 : 2

Cherry Pink
red : white = 4 : 3

He makes 60 litres of Rose Pink paint.
 To this Rose Pink paint he adds 80 litres of red paint and 28 litres of white paint

Has he now made Cherry Pink paint?
 You must show your working.

[4 marks]

New Ratio is 100 : 68
 simplify 50 : 34
 25 : 17
 Not the same as 4 : 3
NO!

30 (a) Work out $\frac{2 \times 10^{14}}{8 \times 10^9}$
 Give your answer in standard form.

$$2 \div 8 = 0.5$$

$$10^{14} \div 10^9 = 10^5$$

[2 marks]

$\rightarrow 0.5 \times 10^5$
 not standard form
 $= 5 \times 10^4$

Answer 5×10^4

30 (b) $6200.07 = 6.2 \times 10^c + 7 \times 10^d$

Work out the values of c and d .

[2 marks]

$$\begin{array}{r} 6200 + 0.7 \\ \hline 6.2 \times 10^{\textcircled{3}} + 7 \times 10^{\textcircled{-1}} \end{array}$$

$c = 3$ $d = -1$

31 $V = \frac{k}{H}$ where k is a constant.

Which **two** statements are correct?

Tick **two** boxes.

[1 mark]

- V is directly proportional to H
- V is inversely proportional to H
- V is directly proportional to $\frac{1}{H}$
- V is inversely proportional to $\frac{1}{H}$

Attachments

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