"BETWEEN PAPERS" PRACTICE

(F&H)

*Thanks to Adam Smith & Don Walker.*

SUMMER 2018

SOLUTIONS

NOT A "BEST" GUESS PAPER.

Neither is it a "prediction" ... only the examiners know what is going to come up! Fact!
You also need to REMEMBER that just because a topic came up on paper 1 it may still come up on papers 2 or 3 ...

We know how important it is to practice, practice, practice .... so we've collated a load of questions that weren't examined in the AQA 9-1 GCSE Maths paper 1 but we cannot guarantee how a topic will be examined in the next papers ...

Enjoy!
Mel & Seager

Not a predicted paper ... I'm a practice paper!

Q1. Circle the inequality shown by the diagram.
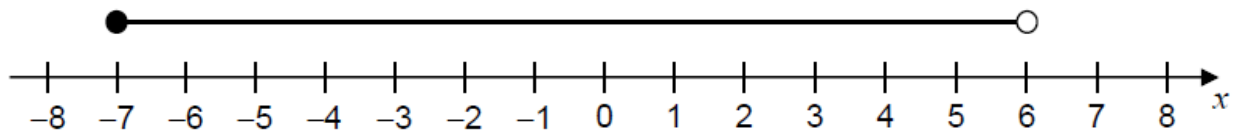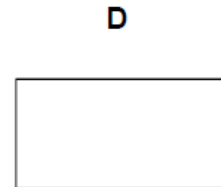

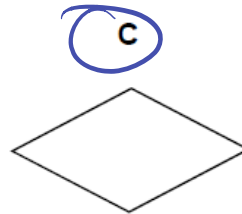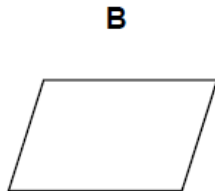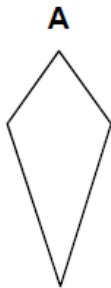$-7 < x < 6$ $\boxed{-7 \leq x < 6}$ $-7 < x \ll 6$ $-7 \ll x \ll 6$

[1]

Q2. Which shape has two lines of symmetry and its diagonals intersecting at 90°?

A   B   C   D
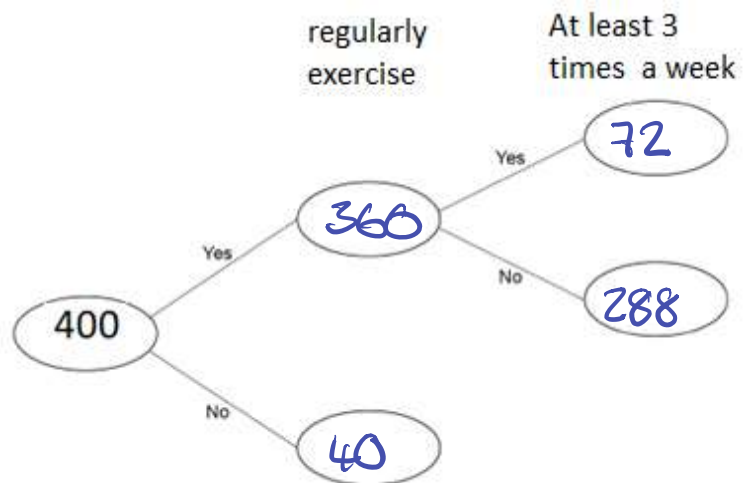

Circle the correct letter.

[1]

Q3. 400 people are asked if they exercise regularly.

$\frac{9}{10}$ say Yes.

20% of the people who say Yes exercise at least 3 times a week. .

(a) Complete the frequency tree.

$\frac{9}{10}$ of 400

regularly exercise   At least 3 times a week

400

Yes → 360
  Yes → 72
  No → 288

No → 40

[4 marks]

(b) What fraction of the 400 people exercise at least 3 times a week?
Give your answer in its simplest form.

[2 marks]

$\frac{72}{400}$ $\frac{36}{200}$ $\frac{18}{100}$ $\frac{9}{50}$

Q4. Circle the expression that can be written as $2y^2$ [1]

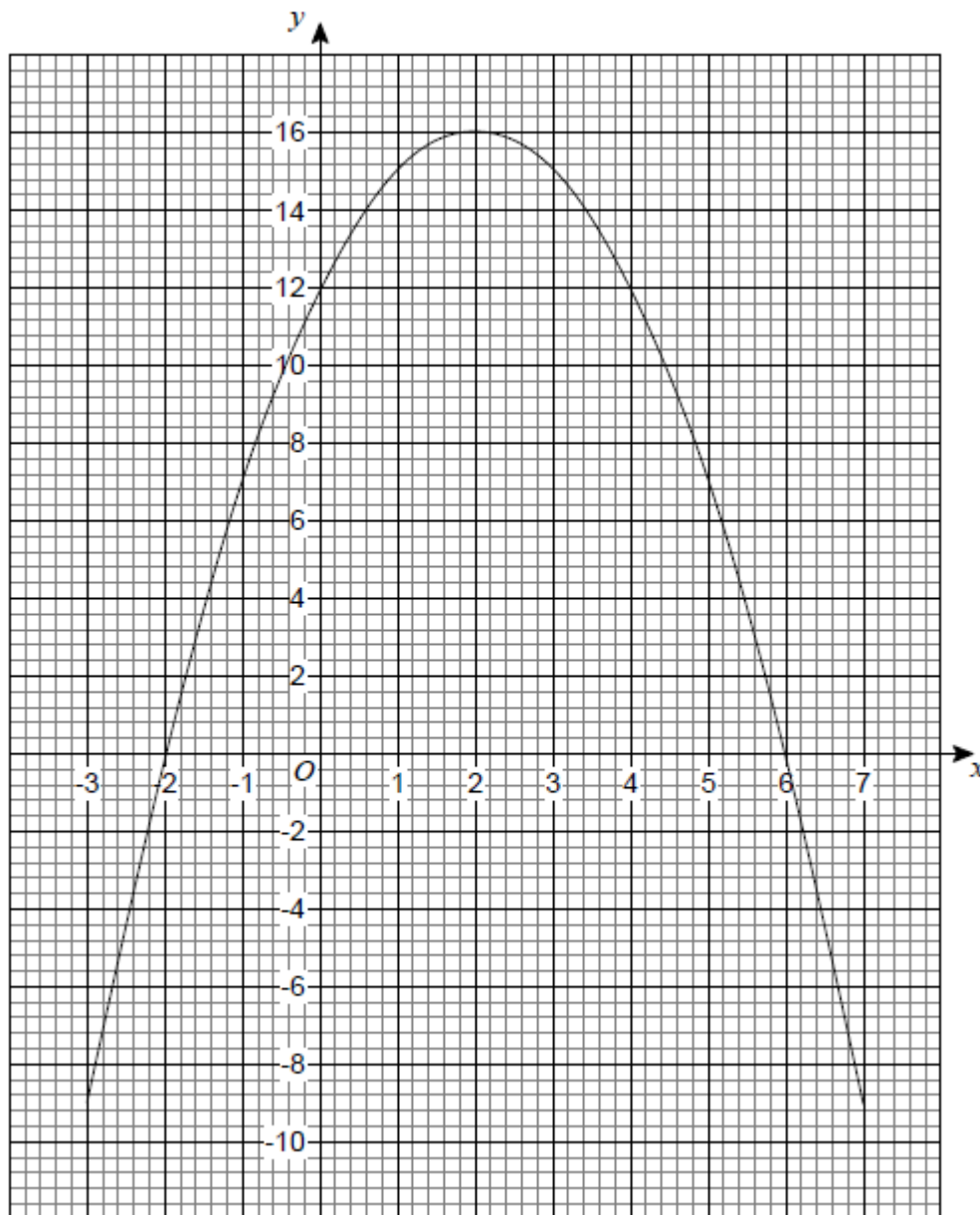$(2y)^2$ $2 \times 2 \times y$ $\boxed{2 \times y \times y}$ $2 \times 2 \times y \times y$

Not a predicted paper … I'm a practice paper!

Q5. The graph $y = a + bx - x^2$ is shown.

(a) Circle the coordinates of the turning point of the curve.

(-2, 0)   (0, 12)((2, 16))   (6, 0)

[1]

(b) Circle the value of a.
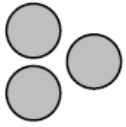
[1]

-2   12   16   6

(c) Circle the two roots of $a + bx - x^2 = 0$
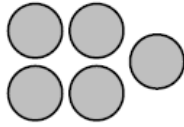
-2 and 6   2 and -6   2 and 6   -2 and -6

[1]

Not a predicted paper … I'm a practice paper!

Q6. The diagram shows a sequence of patterns. $2n + 1$

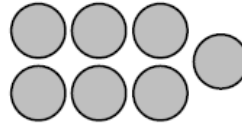
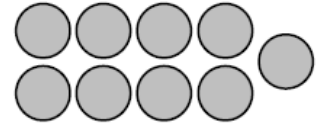Pattern 1   Pattern 2   Pattern 3   Pattern 4

3   5   7   9

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

$2 \times 6 + 1 = 13$ [1]

(b) Complete the rule below.

[1]

Number of circles = Pattern number $\times$ $\boxed{2}$ + $\boxed{1}$

(c) Which Pattern number has 51 circles?

$2n + 1 = 51$ $n = 25$
$2n = 50$ [1]

Q7. Three straight lines are shown.

Work out the value of x.

Not drawn
accurately

$2x + 15 = 3x - 38$
$-2x + 38 = -2x + 38$

$53 = x$

$2x + 15°$

$3x - 38°$

$x = 53°$
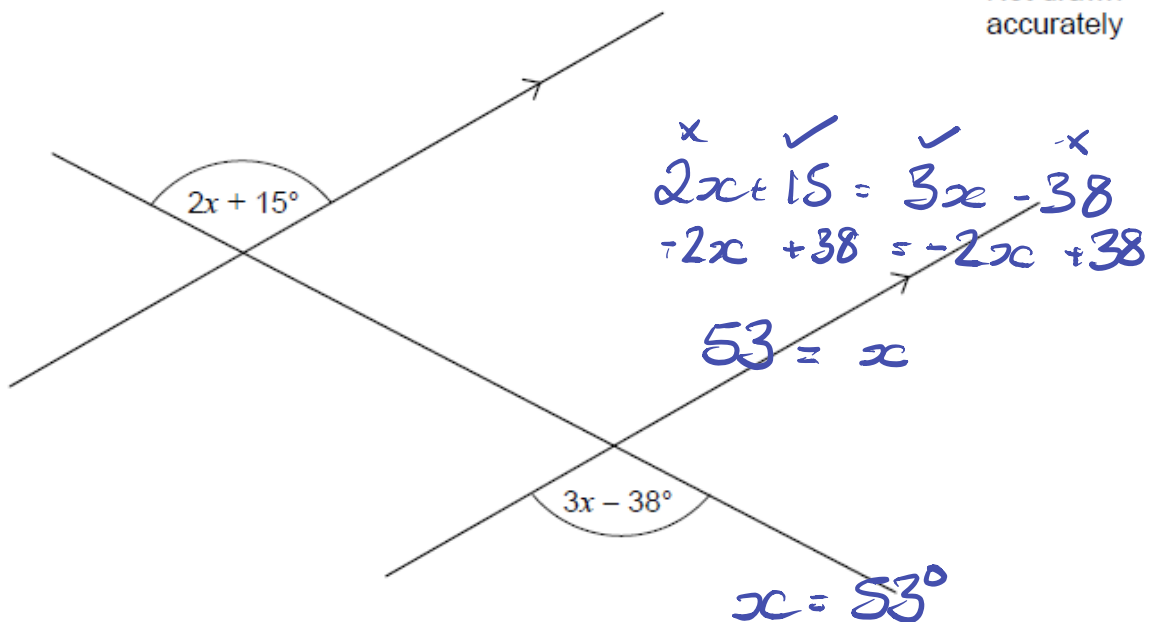
[3]

Q8. ABC is a triangle with AB = AC

BA is parallel to CD. ~~are this~~

Show that angle x = 30°

$BCP = 75°$ (angles in a triangle = 180°

$ABP = 75 - 15 = 60°$

$BAC = 30°$

∴ $x = 30$ alternate angles are equal
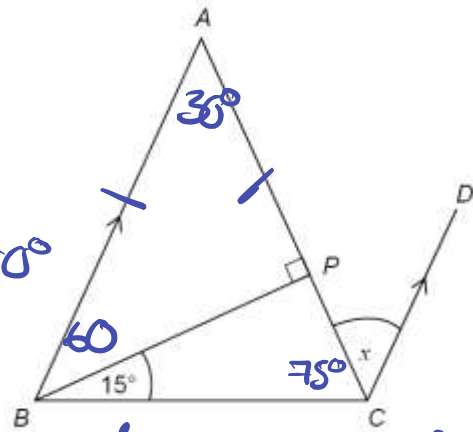
[3]

Q9. Four identical circles just fit inside a square as shown.
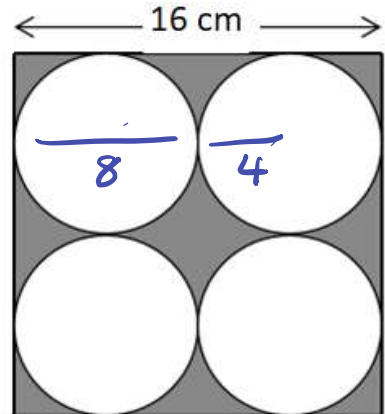
Work out the area of the shaded section.

Give your answer in terms of π.

area of square   circle   4 circles

$= 16 \times 16$ $= \pi \times 4^2$ $= 16\pi \times 4$

$= 256$ $= 16\pi$ $= 64\pi$
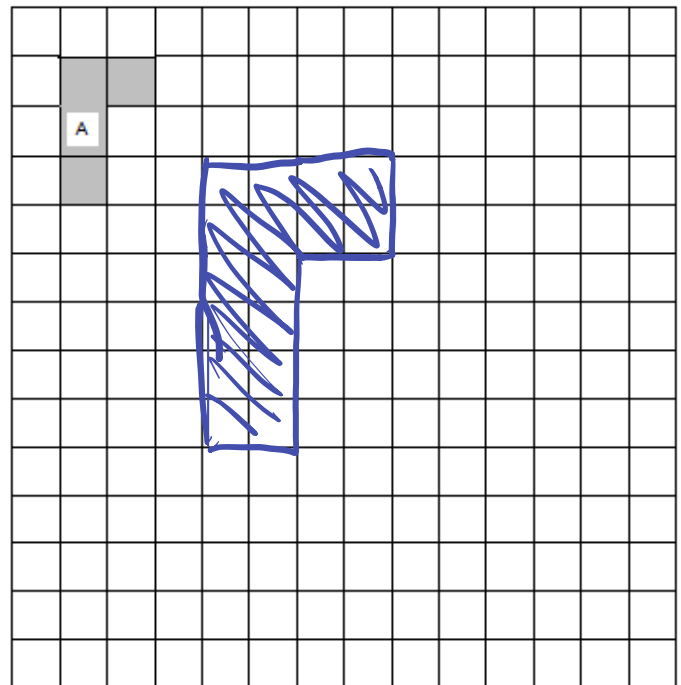
∴ Shaded area $= 256 - 64\pi$

[4]

Q10. On this grid draw a shape that is an enlargement of shape A.

Lots of possibles ...

[1]

Q11. 1 mile = 5280 feet   1 foot = 12 inches   1 inch = 2.54 cm

Use the given conversions to show that 1600 metres is approximately 1 mile.

1 mile $= 5280$

$\times 12 = 63360$ inches

$63360 \times 2.54 = 160934.4$ cm

$\div 100$

$= 1609.34$ metres

as required. $1609 ≈ 1600$

[3]

Not a predicted paper ... I'm a practice paper!

Q12. In the diagram the area of triangle ABD is 56 cm²

Work out the length of CD.

$DC^2 = 8^2 + 6^2$
$= 100$
$DC = \sqrt{100}$

$\frac{1}{2}$ base × height = 56

$\frac{1}{2}$ 14 × x = 56

$x = \frac{56 \times 2}{14} = 8$

CD = 10cm

[4]

Not drawn accurately

14 cm   6 cm x 8

Q13. Circle the vector that translates shape R to shape S
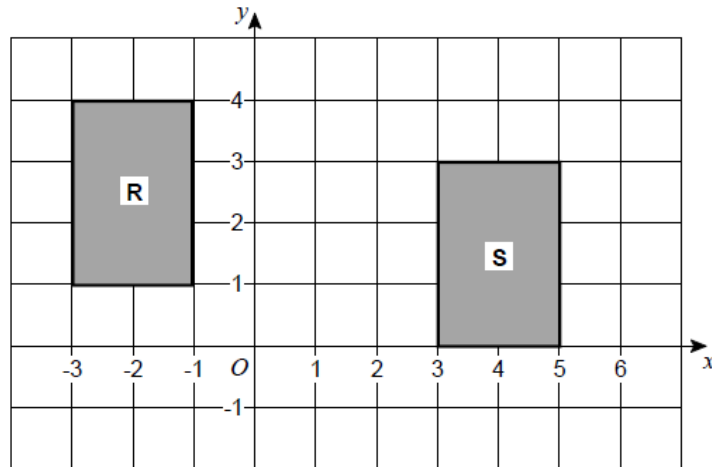
$\binom{1}{-6}$ $\binom{6}{-1}$ $\binom{-1}{6}$ $\binom{-6}{1}$
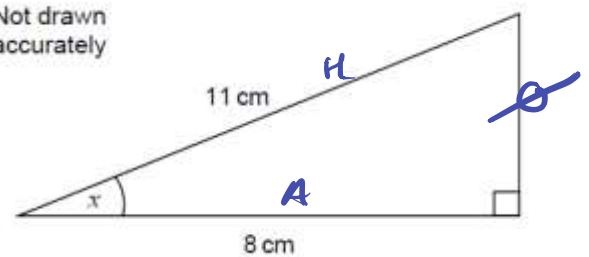
[1]

Q14. (a) Work out the size of angle x.

$\cos x = \frac{8}{11}$

$x = \cos^{-1} \frac{8}{11}$

$= 43.34°$

Not drawn accurately

11 cm   8 cm
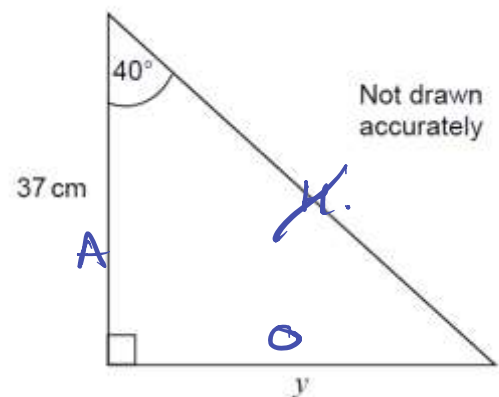
[2]

(b) Work out length y.

$\tan 40 = \frac{y}{37}$

$y = 37 \times \tan 40$

$= 31.05 cm$

40°   Not drawn accurately

37 cm

[2]

Not a predicted paper … I'm a practice paper!

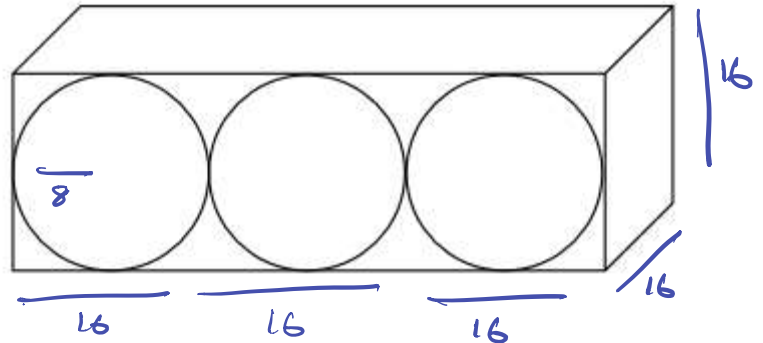**Q15.** Volume of a sphere $= \frac{4}{3}\pi r^3$ where r is the radius.

a) Work out the volume of a sphere of radius 5 cm. Leave your answer in terms of π

$$\frac{4}{3} \times \pi \times 5^3 \quad = \quad \frac{500\pi}{3} \, cm^3$$

[2]

b) Three spheres of radius 8 cm are packed tightly into a cuboid as shown.

$$16 \times 16 \times 48 = 12288 \, cm^3$$

Work out the volume of the cuboid.

[4]

Q16..
$$2x + 3y = 15.5 \quad ①$$
$$x + y = 6 \quad \times 2 \quad ②$$

Work out the values of x and y.

$$2x + 3y = 15.5 \quad ③$$
$$2x + 2y = 12 \quad ④$$
$$\underline{\qquad\qquad\qquad\qquad}$$
$$y = 3.5$$

③ ④

subinto②
$$x + 3.5 = 6$$
$$x = 2.5.$$

x = ...2.5.............

y = ...3.5...........[3]

Q17. A shape is made using 15 identical rectangles.

Work out the area of the shape. 9

$$16.2 \div 3 = 5.4$$

$$16.2 - (10.8) = 5.4$$

$$5.4 \div 3 = 1.8$$

1.8 | 5.4 | 1.8 | 5.4 | 1.8

16.2 cm

$$area = 9 \times 16.2 = 145.8 \, cm^2$$

[4]

Not a predicted paper … I'm a practice paper!
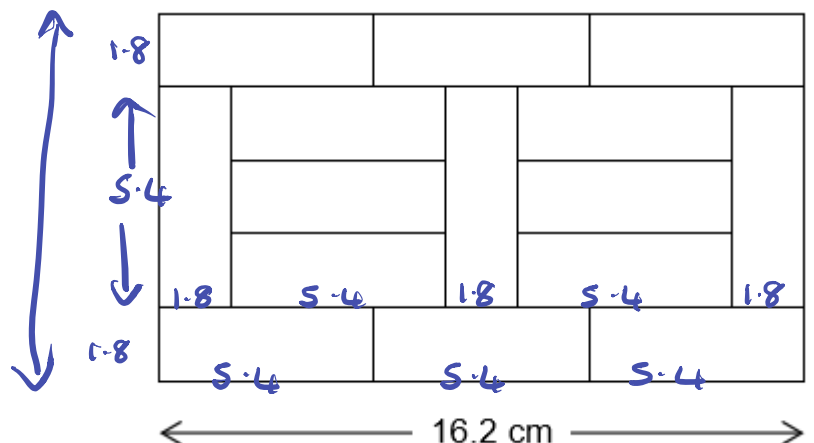
Q18. Beth uses these four cards to make 4-digit numbers.

| 2 | 4 | 5 | 8 |

How many different 4-digit numbers can she make that are greater than 8000?

$$\frac{8}{1} \, \square \, \square \, \square$$

$1 \times 3 \times 2 \times 1 = 6 \text{ ways.}$

[2]

Q19. Diaries are sold in boxes of 12   12, 24, 36, 48, 60

Pencils are sold in boxes of 10   10   20   30   40   50   60
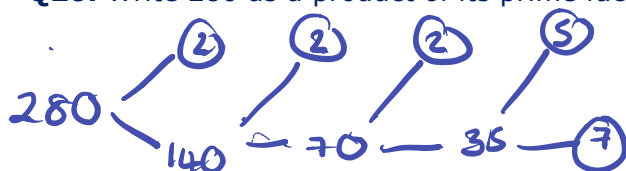
Rulers are sold in boxes of 6   6, 12 . . .   60

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.

_____5_____ boxes of diaries

_____6_____ boxes of pencils

_____10_____ boxes of rulers

[3]

Q20. Write 280 as a product of its prime factors.

280 — 140 — 70 — 35 — 7

(2) (2) (2) (5) (7)

$2^3 \times 5 \times 7.$

[2]

Q21. In a sale, the original price of a bag was reduced by $\frac{1}{5}$

The sale price of the bag is £29.40

Work out the original price.

$\frac{4}{5} = 80\%$ $\frac{1}{5}$

29.40

$80\% = 29.40$

$20\% = 7.35$

$100\% = £36.75$

[3]

Q22. Which of these can be written as $\frac{a}{b}$?   Circle your answer.

[1]

$b \div a$ $a - b$ $\boxed{a \div b}$ $b - a$

Not a predicted paper … I'm a practice paper!
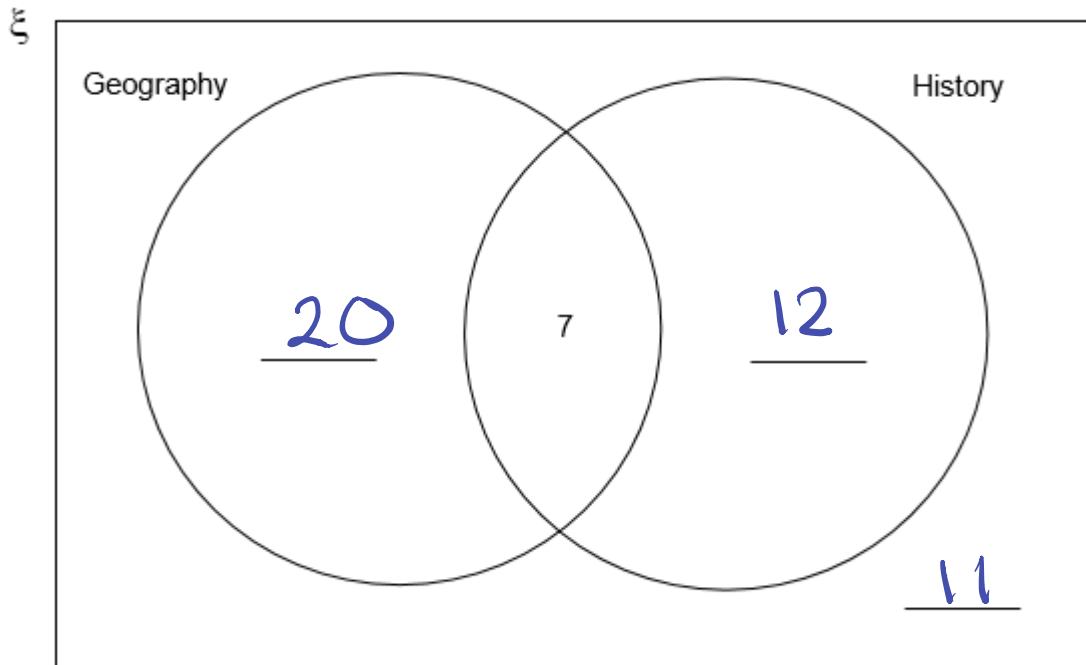
Q23. 50 students are asked if they study Geography or History.

The Venn diagram shows some information about their answers.

ξ

Geography

History

20

7

12

11

a) What does the number 7 on the diagram represent?

the number of students who study both subjects [1]

b) 20 students study Geography but not History.

19 students study History. 19 - 7 = 12

Complete the Venn diagram. 20 + 7 + 12 = 39

50 - 39 = 11 [3]

Q24. Cola is sold in packs of 6 and packs of 8

What is the cheapest way to buy 48 cans of cola?

You must show your working.

1 pack of 6 for £1.95
or
2 packs of 6 for £3.50

1 pack of 8 for £2.64
or
2 packs of 8 for £5.00

×4 { 12 = £3.50 } ×4   ×3 { 16 cans = £5.00 } ×3 [4]
   { 48 = £14 }   { 48 = £15. }

Packs of 6 are cheapest.

Q25. £800 is invested for 3 years at 2% simple interest per year.

Work out the total interest.

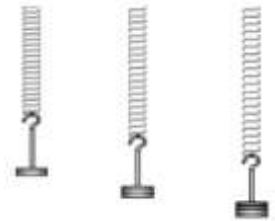$800 \times 1.02 \times 1.02 \times 1.02 = 849.97$
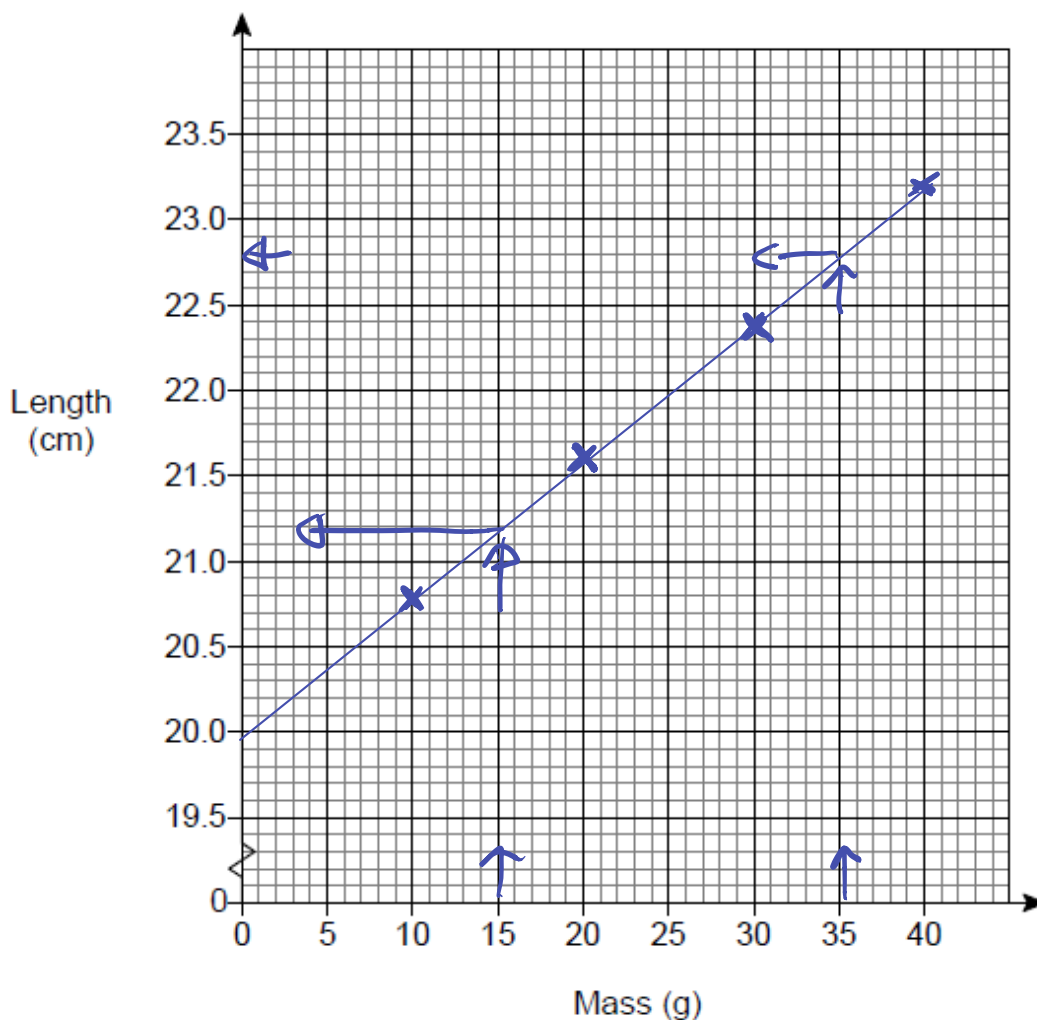
$849.97 - 80 = £49.97$ [3]

Q26. In an experiment, different masses are hung on a spring.

The length of the spring is measured for each mass.

Mass (g)	10	20	30	40
Length (cm)	20.8	21.6	22.4	23.2

(a) Draw a graph to show the length of the spring for masses from 10 g to 40 g

[2]

(b) Estimate the length of the spring with no mass hung on it. 20.0cm

[1]

(c) How much longer is the spring with a 35 g mass than with a 15 g mass?

$22.8 - 21.2 = 1.60cm$ [2]
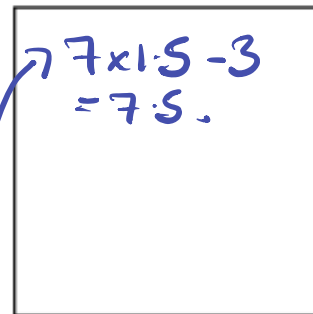
Not a predicted paper … I'm a practice paper!

Q27. The diagram shows a square.

$(7x - 3)$ cm

$7x - 3 = 3x + 3$

$4x = 6$

$x = 1.5$

$7 \times 1.5 - 3$
$= 7.5.$

$3x + 3$

$3(x + 1)$ cm

$3 \times 1.5 + 3$
$= 7.5$

Work out the length of one side of the square.

7.5cm

[4]

Q28. (a) Factorise fully $9a^2 - 6a$

$3a(3a - 2)$

[2]

(b) Solve $x^2 - 12x + 20 = 0$

$1, 20$
$2, 10$
$4, 5$

$(x - 2)(x - 10) = 0$

$x = 2$ or $x = 10$

[3]

Q29. A football team has P points $P = 3W + D$

W is the number of wins

D is the number of draws

(a)   A team has 6 wins and 2 draws. How many points does the team have?

$P = 3 \times 6 + 2$ $P = 20$

[1 mark]

(b)   After 33 games a different team has 53 points.   11 games were draws.

How many games has this team lost?

$P = 53$
$D = 11$

$53 = 3W + 11$
$3W = 42$ $W = 14$

P

$33 - (14 + 11)$
$= 8$

[4 marks]

Q30. In a school show,

girls : boys = 1 : 1

girls who sing : girls who do not sing = 1 : 2

8 girls sing in the show.

How many students are in the show altogether?

$G : B$
$1 : 1$

$1 : 2$
8 16

$24 + 24 = 48$

[3 marks]

Not a predicted paper … I'm a practice paper!

Q31. Factorise   15x + 35y − 40z
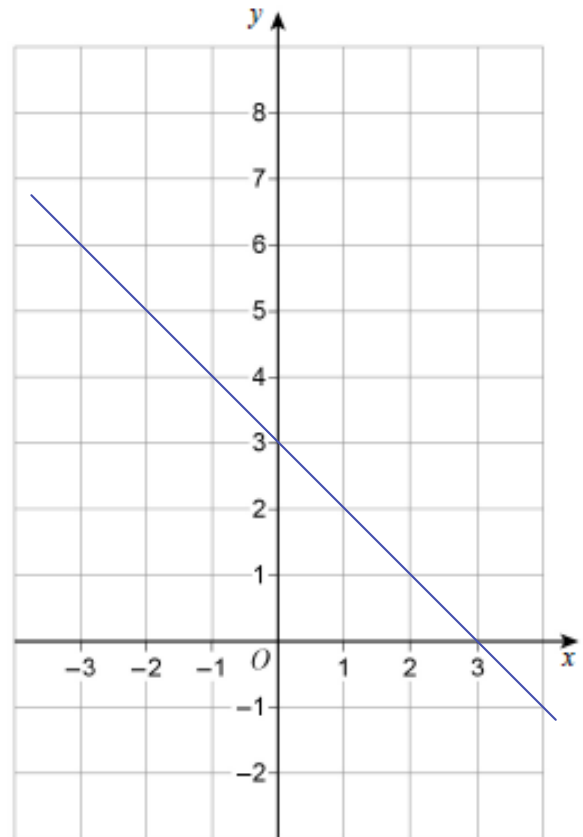
$$5(3x + 7y - 8z)$$

[1]

Q32

$x \; y$

a. Does the point (2, 9) lie on the line x + y = 4

$2 + 9 = 11$ not 4

so no it doesnt.

[1]

(b) Draw the line x + y = 3 for values of x from −3
     to 3

[2 marks]

Q33. Expand and simplify (y + 5)(y - 4)

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

[2]

Q34 Circle the equation with roots 4 and -8

$x - 4$
$x + 8$

4x(x - 8) = 0   (x - 4)(x + 8) = 0

x² - 32 = 0   (x + 4)(x - 8) = 0

[1]

Not a predicted paper … I'm a practice paper!