

Name: _____

GCSE 9-1 Higher
Practice Paper
Set A
Paper 1 - Non Calculator



Equipment

1. A black ink ball-point pen.
2. A pencil.
3. An eraser.
4. A ruler.
5. A pair of compasses.
6. A protractor.

Guidance

1. Read each question carefully.
2. Don't spend too long on one question.
3. Attempt every question.
4. Check your answers seem right.
5. Always show your workings

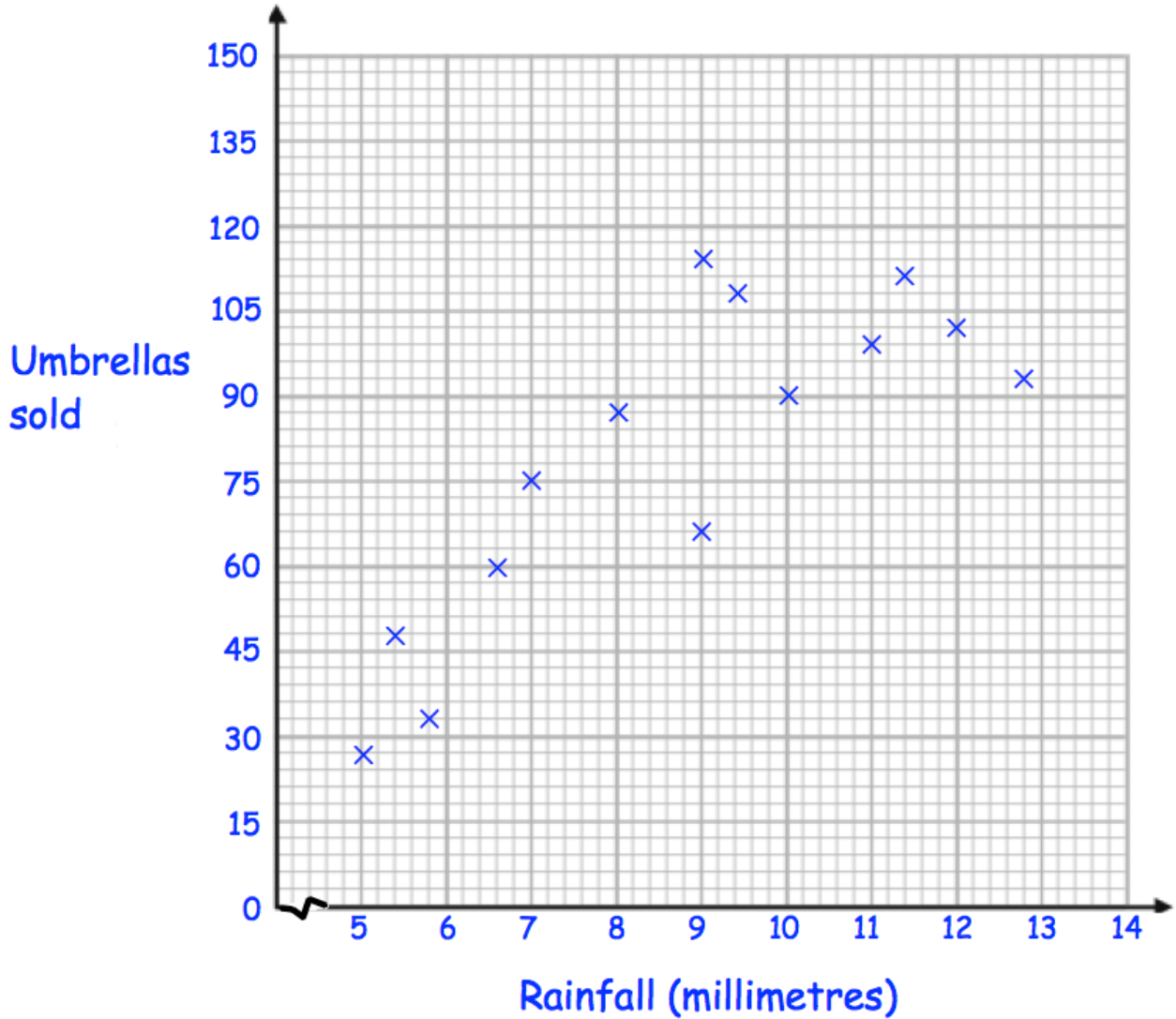
Information

1. Time: 1 hour 30 minutes
2. The maximum mark for this paper is 80.
3. The marks for questions are shown in brackets
4. You may use tracing paper.

Question	Mark	Available
1		5
2		2
3		3
4		3
5		4
6		2
7		3
8		3
9		4
10		3
11		5
12		2
13		4
14		4
15		4
16		4
17		4
18		3
19		4
20		5
21		4
22		5
Total		80

1. A shop sells umbrellas.

The scatter graph shows information about the number of umbrellas sold each week and the rainfall that week, in millimetres.



(a) Describe the relationship between the rainfall and umbrellas sold.

.....
.....

(1)

(b) What is the most number of umbrellas sold in one week?

.....
(1)

(c) In how many weeks did the shop sell over 105 umbrellas?

.....
(1)

In another week, there was 6mm of rain.

(d) Estimate the number of umbrellas sold.

.....
(1)

(e) Explain why it may **not** be appropriate to use your line of best fit to estimate the number of umbrellas sold in a week with 25mm of rainfall.

.....
.....
(1)

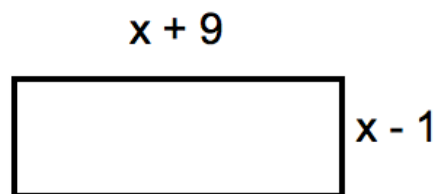
2. Write 60 as a product of its prime factors.

.....
(2)

3. Work out $412.8 \div 2.4$

.....
(3)

4. A rectangle is shown below.



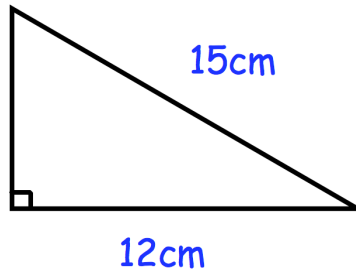
The length of the rectangle is $x + 9$ cm.

The width of the rectangle is $x - 1$ cm.

Form an expression for the area of the rectangle.

.....
(3)

5.

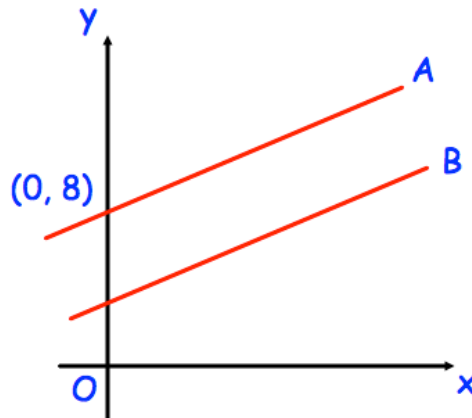


Shown is a right-angled triangle.

Work out the area of the triangle

.....
(4)

6.



The lines A and B are parallel.

The line A passes through the point (0, 8)

The line B has equation $y = 3x + 1$

Write down the equation of line A

.....
(2)

7. 10 girls and 15 boys sit a test.

The mean mark for the boys is 70.

The mean mark for the girls is 82.

Work out the mean mark for the whole class.

.....
(3)

8. Jacob buys a watch costing £84
This cost includes VAT at a rate of 20%.

How much is the watch without VAT?

£.....
(3)

9. (a) Express $\sqrt{75}$ in its simplest form

.....
(1)

(b) Arrange the following numbers in order, smallest to largest

$$5\sqrt{3} \quad 3\sqrt{10} \quad 2\sqrt{22} \quad 4\sqrt{5}$$

.....
(3)

10. Expand and simplify $(1 - 2x)(x + 3)(x - 1)$

.....
(3)

11.

(a) Find the value of $100^{\frac{1}{2}}$

.....
(1)

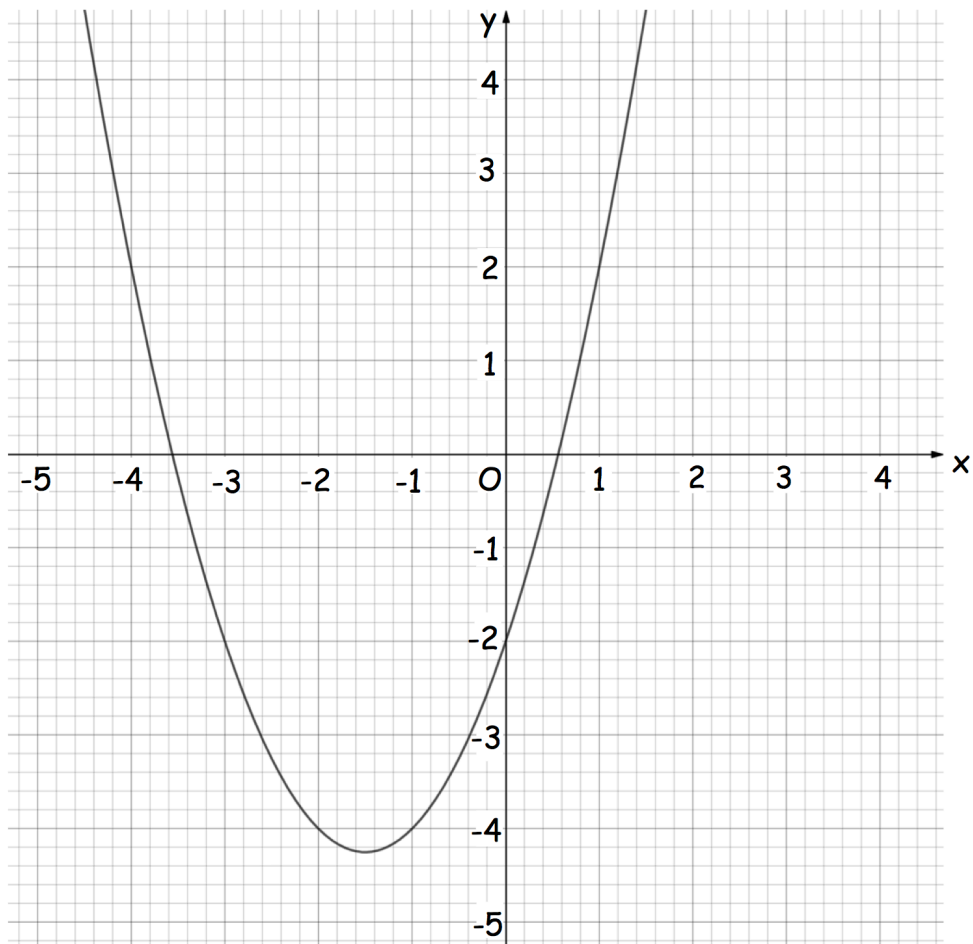
(b) Find the value of $4^{-\frac{5}{2}}$

.....
(2)

(c) Simplify $(27x^6)^{\frac{2}{3}}$

.....
(2)

12. The graph of $y = f(x)$ is shown on the grid



(a) Write down an estimate for the coordinates of the turning point of the graph

(.....,)
(1)

(b) Use your graph to find the value of $f(1.2)$

.....
(1)

13. The force, F newtons, exerted by a magnet on a metal object is inversely proportional to the square of the distance d cm.

When $d = 2$ cm, $F = 50$ N.

(a) Express F in terms of d .

$$F = \dots\dots\dots \text{N}$$

(3)

(b) Find the force when the distance between the magnet and metal object is 10cm

$$F = \dots\dots\dots \text{N}$$

(1)

14. The cost of a mobile phone is x pounds
The cost of a television is y pounds

When both prices are increased by £40, the ratio for the cost of the mobile phone to the cost of the television is 15:22

When both prices are decreased by £100, the ratio for the cost of the mobile phone to the cost of the television is 8:15

Find the values of x and y

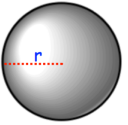
$$x = \text{£}.....$$

$$y = \text{£}.....$$

(4)

15. A solid wooden sphere has radius of 5.97cm

- (a) Work out an estimate for the volume of the sphere
Give your answer in terms of π

Volume of a sphere = $\frac{4}{3}\pi r^3$ 

.....cm³
(2)

The sphere has a mass of 1002g

Richard wants to work out the density of the wood.

In his calculations, he uses a radius of 6cm and a mass of 1000g

- (b) Is his answer an over-estimate or an under-estimate of the actual density?
Explain why

(2)

16. Prove algebraically that

$$(4n + 1)^2 - (2n - 1) \text{ is an even number}$$

for all positive integer values of n .

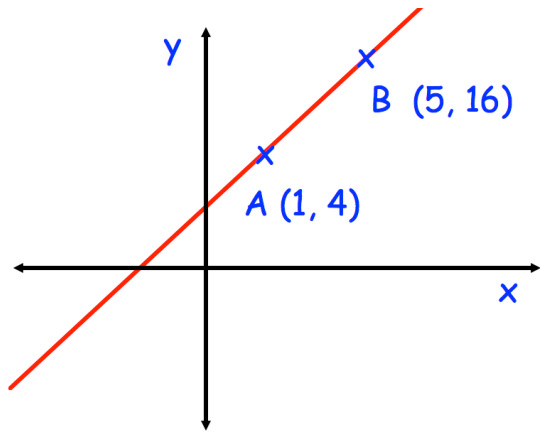
(4)

17. Samantha has 10 black socks, 8 white socks and 2 blue socks.
She picks two socks at random, without replacement.

Calculate the probability she chooses two socks of the same colour.

.....
(4)

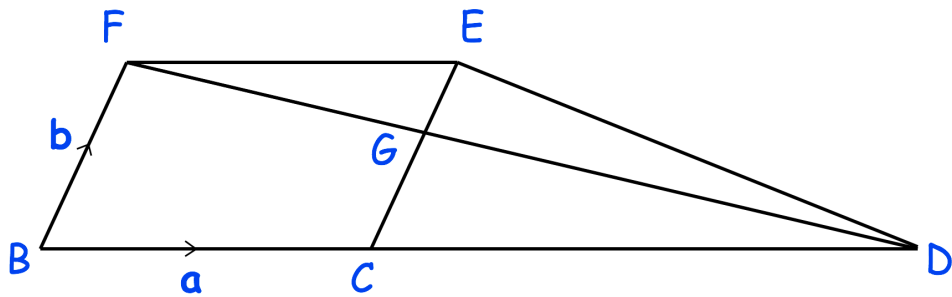
18. A straight line passes through the points $A(1, 4)$ and $B(5, 16)$.



Find the equation of the line perpendicular to AB that passes through the midpoint of AB .

.....
(3)

19. BCEF is a parallelogram.
 The point C is a point on the line BCD such that $BC : CD = 4 : 7$
 FD and CE meet at the point G.



$$\vec{BC} = \mathbf{a} \qquad \vec{BF} = \mathbf{b}$$

Work out \vec{GD} in terms of \mathbf{a} and \mathbf{b}
 Give your answer in its simplest form.

.....
(4)

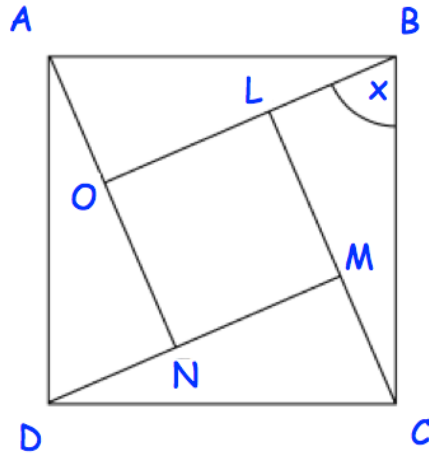
20. Solve the simultaneous equations

$$x^2 + y^2 = 1$$

$$x + 2y = 1$$

.....
(5)

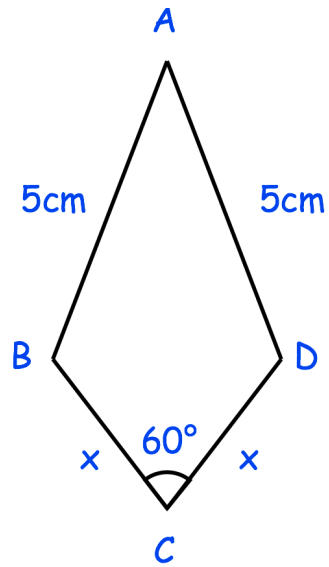
21. ABCD and LMNO are squares.
Angle CBL = x



Prove that triangles ABO and CBL are congruent.

(4)

22. The diagram shows a kite ABCD.



Given that $BC = CD = x$ cm
 $AB = AD = 5$ cm
angle $BCD = 60^\circ$

Prove $\cos BAD = 1 - \frac{x^2}{50}$

(5)