

BUMPER "BETWEEN PAPERS" PRACTICE SUITABLE FOR HIGHER TIER ONLY

SUMMER 2019 QUESTIONS

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**

1. A menu has a choice of 3 starters, 5 main courses and 4 desserts.

How many different choices of a 3-course meal are possible?

Circle your answer.

12

23

60

972

[1]

2. Use the quadratic formula to solve $5x^2 + 11x - 2 = 0$

Give your solutions to 2 decimal places.

[3]

3. y is directly proportional to x and k is a constant.

Circle the correct equation.

$$y = x + k$$

$$y = kx$$

$$y = \frac{k}{x}$$

$$y = x - k$$

[1]

4. Written as the product of its prime factors

$$672 = 2^5 \times 3 \times 7$$

(a) Write 252 as the product of its prime factors.

[2]

(b) Work out the value of the highest common factor of 672 and 252

[1]

5. Show that $\frac{2x+1}{3} + \frac{5x-2}{2}$ simplifies to $\frac{19x-4}{6}$

[2]

6. Expand and simplify $(2x + 5)(2x - 5)(3x + 7)$

[3]

7. Write $\frac{26}{\sqrt{2}} - \frac{12}{\sqrt{18}} + 2\sqrt{50}$ in the form $a\sqrt{2}$ where a is an integer

[4]

8. Prove that the sum of four consecutive whole numbers is always even.

[3]

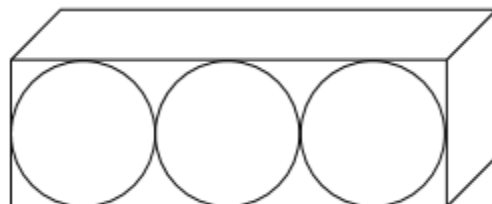
9. Volume of a sphere = $\frac{4}{3} \pi r^3$ where r is the radius.

a) Work out the volume of a sphere of radius 8 cm

[2]

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

Work out the volume of the cuboid.



[4]

10. To complete a task in 15 days a company needs

4 people each working for 8 hours per day.

The company decides to have

5 people each working for 6 hours per day.

Assume that each person works at the same rate.

(a) How many days will the task take to complete?

You must show your working.

[3]

(b) Comment on how the assumption affects your answer to part (a).

[1]

11. The region R satisfies the three inequalities

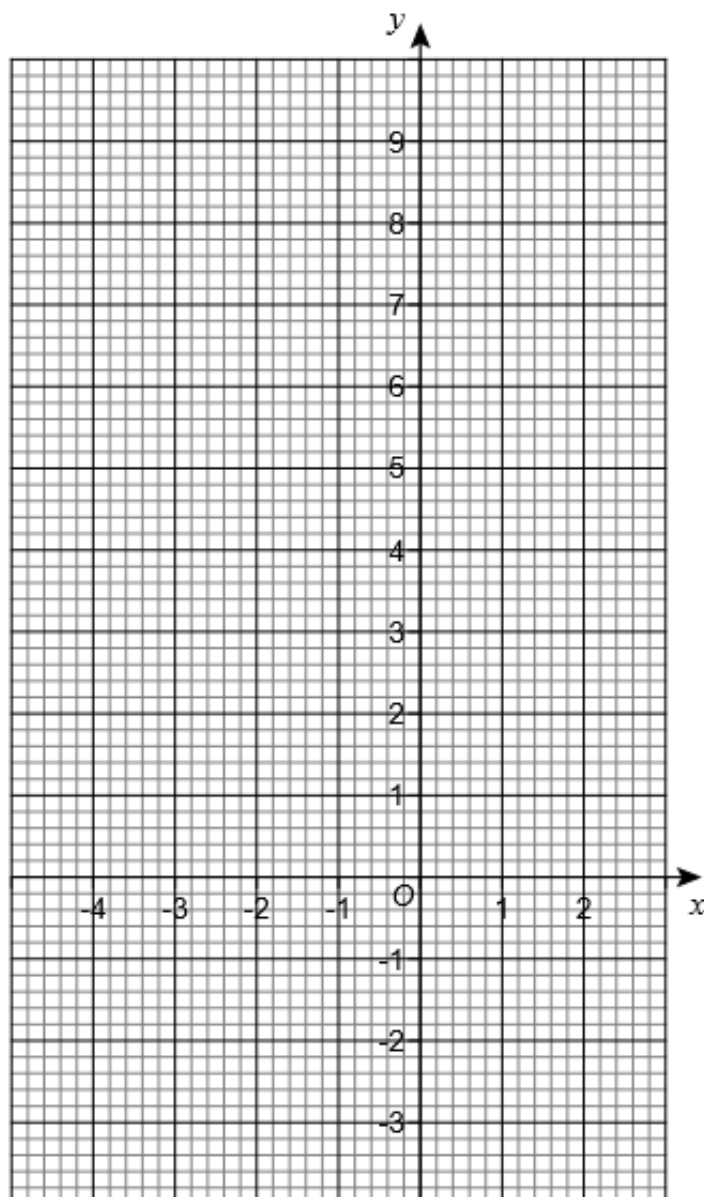
$$x > -3$$

$$x + y \leq 2$$

$$y \geq \frac{x}{2} - 1$$

Show the region R on the grid.

[4]



12. w is directly proportional to y

w is inversely proportional to x^2

a) When $y = 4$, $w = 14$

Work out the value of w when $y = 9$

[2]

b) When $x = 2$, $w = 5$

Work out the value of w when $x = 10$

[3]

13. Show that $\frac{2w+4}{w^2-25} \times \frac{w+5}{w^2+3w+2} \times (3w^2 - 16w + 5)$

Simplifies to $\frac{aw+b}{cw+d}$ where a, b, c and d are integers.

[5]

14. An approximate solution to an equation is found using this iterative process.

$$x_{n+1} = \frac{(x_n)^3 - 3}{8} \text{ and } x_1 = -1$$

a) Work out the values of x_2 and x_3

$$x_2 = \underline{\hspace{2cm}}$$

$$x_3 = \underline{\hspace{2cm}} \quad [2]$$

b) Work out the solution to 6 decimal places.

[1]

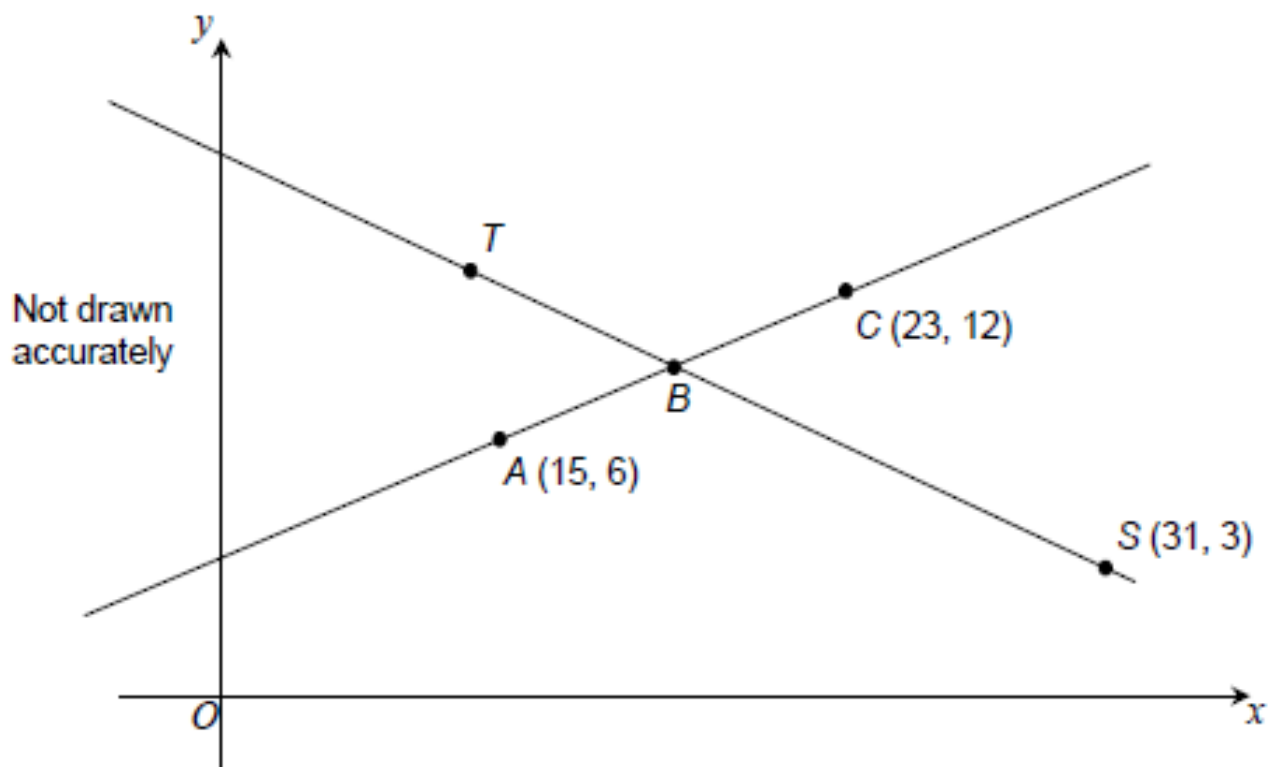
15. Solve algebraically the simultaneous equations

$$x^2 + y^2 = 25$$

$$y - 3x = 13$$

[5]

16. Two straight lines are shown.



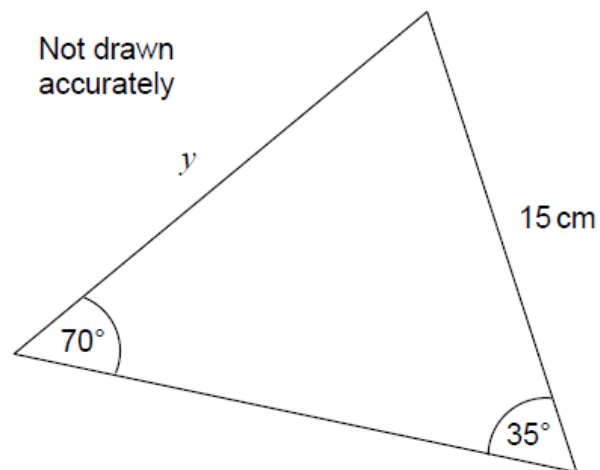
B is the midpoint of AC .

$$TB : BS = 2 : 3$$

Work out the coordinates of T .

[4]

17. Work out the value of y .



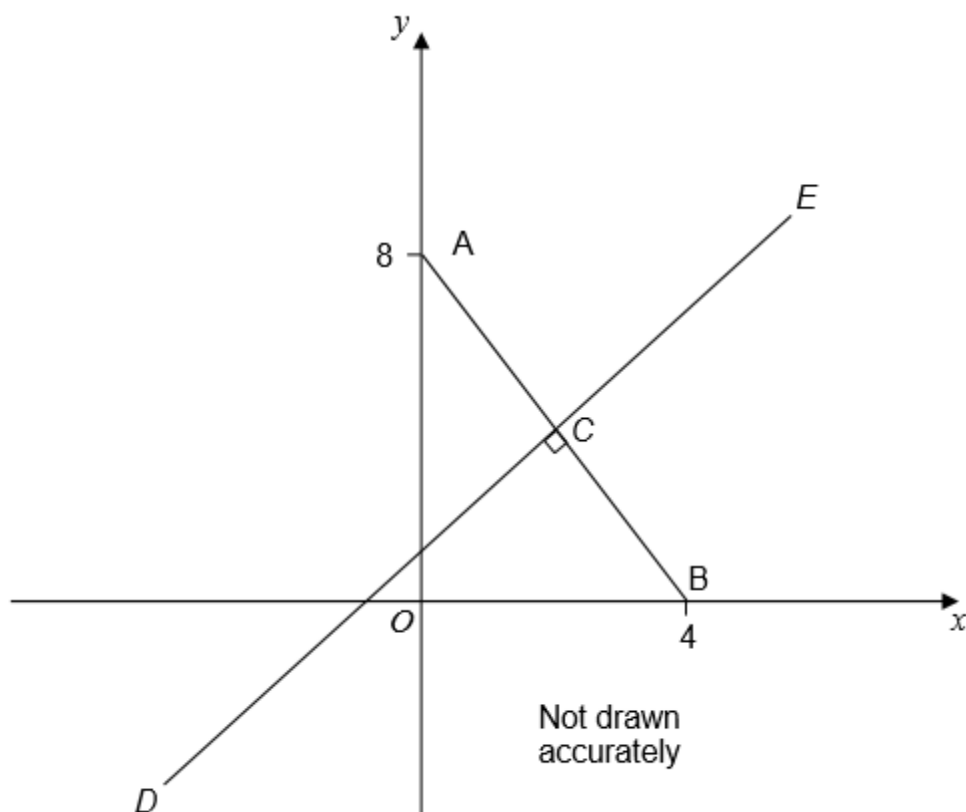
[2]

18. ACB is a straight line.

A is the point (0, 8), and B is the point (4, 0)

C is the midpoint of AB.

Line DCE is perpendicular to line ACB.

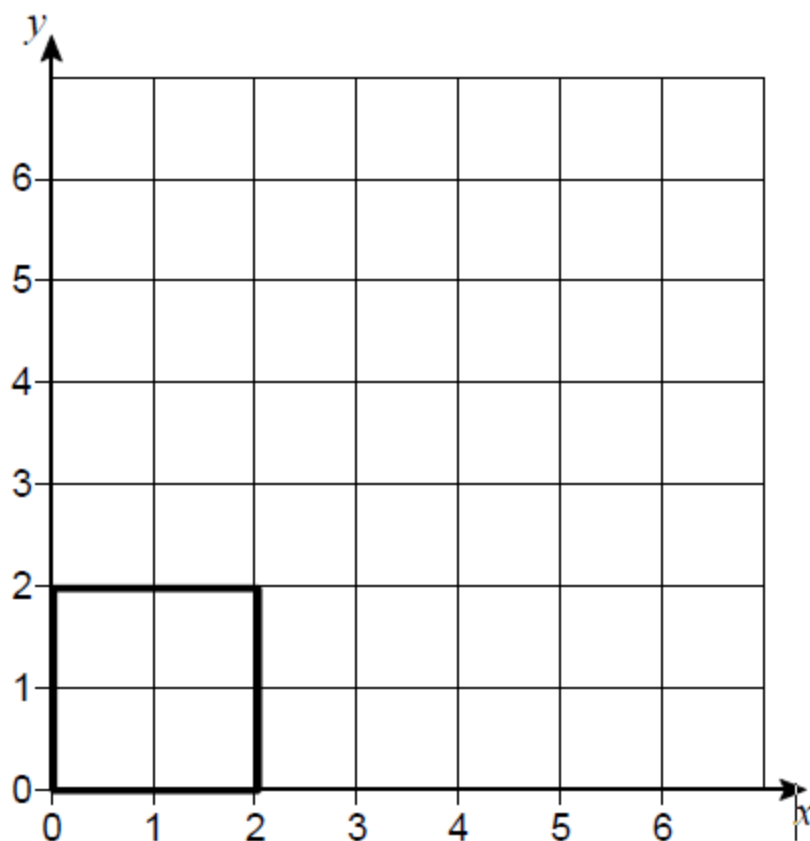


Work out the equation of line DCE.

[5]

19. Square $OABC$ is drawn on a centimetre grid.

O is $(0, 0)$ A is $(2, 0)$ B is $(2, 2)$ C is $(0, 2)$



$OABC$ is enlarged, scale factor 2, centre $(0, 0)$

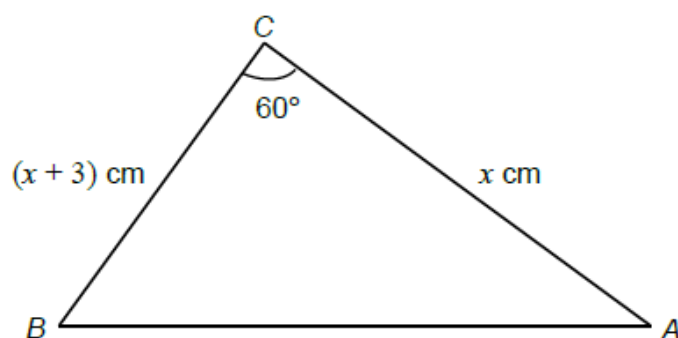
Circle the number of invariant points on the perimeter of the square.

0 1 2 4

[1]

20. The area of the triangle is $\sqrt{300} \text{ cm}^2$.

Calculate the length of AB .



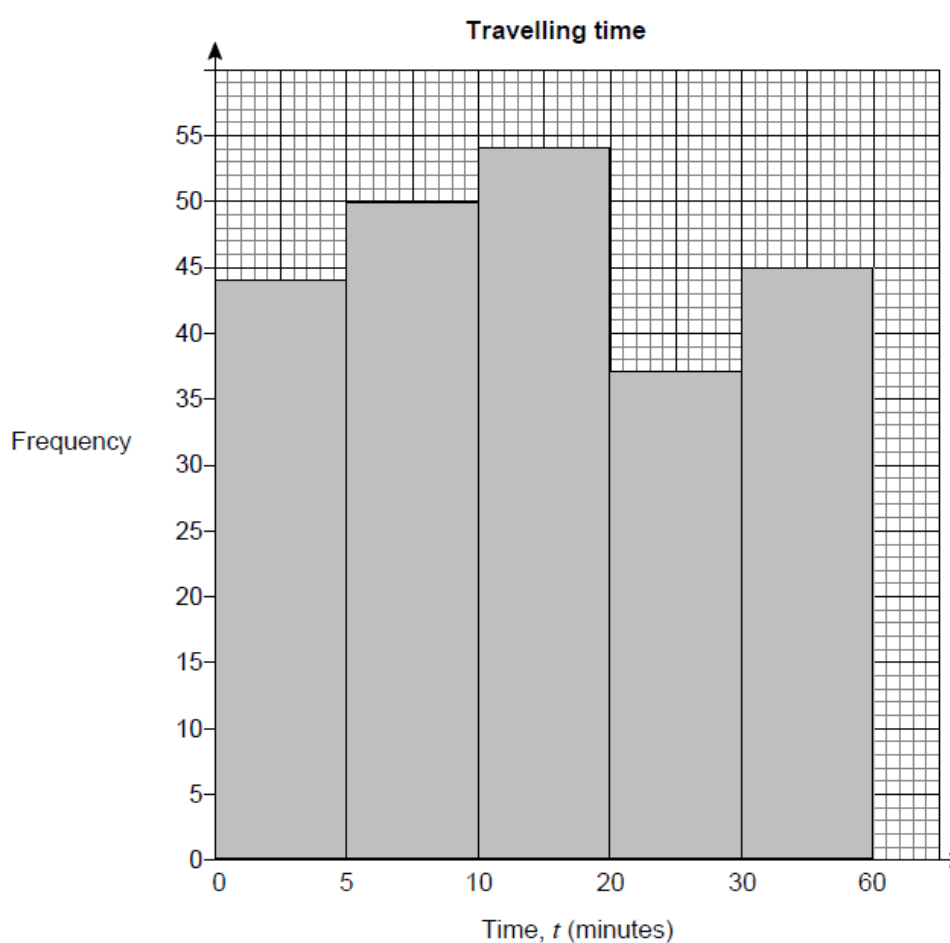
[8]

21. Joe asked 230 students how long it took them to travel to school.

The results are shown in the table.

Travelling time, t (minutes)	Number of students
$0 < t \leq 5$	44
$5 < t \leq 10$	50
$10 < t \leq 20$	54
$20 < t \leq 30$	37
$30 < t \leq 60$	45

This is Joe's attempt to draw a histogram to show the data.

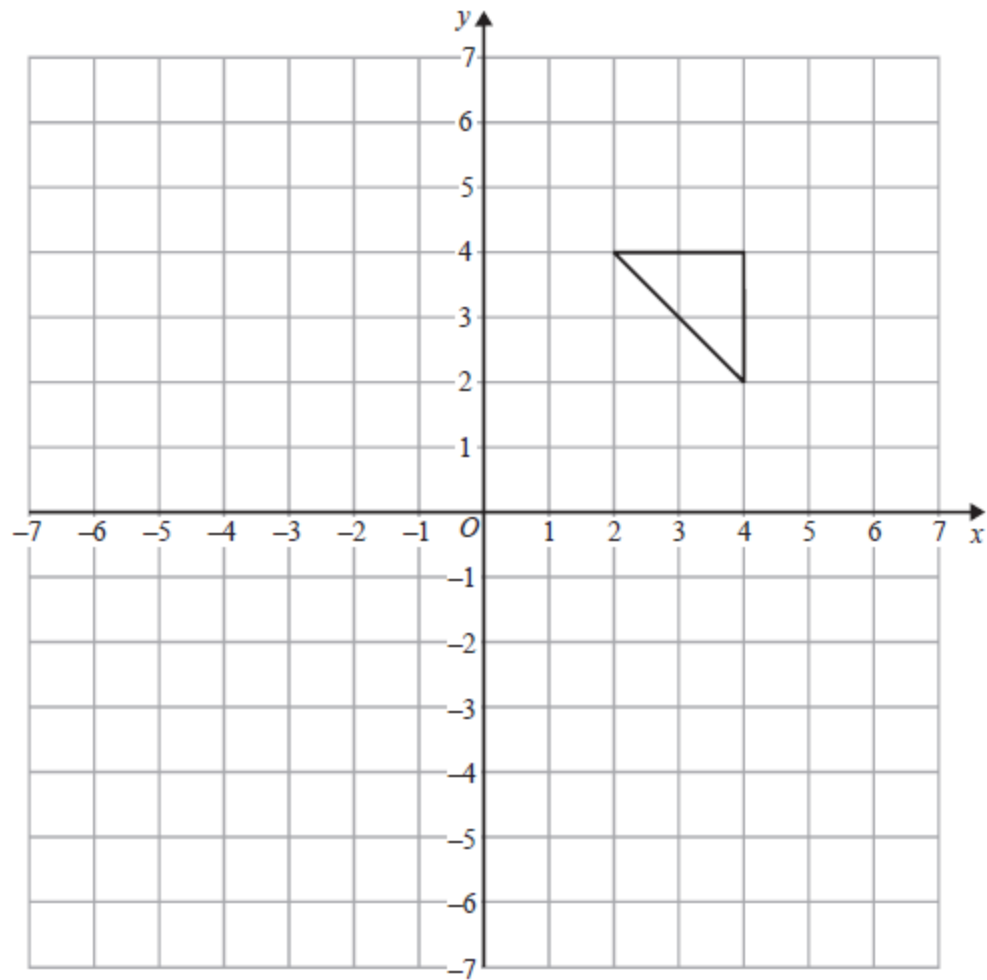


Make two criticisms of his histogram.

Criticism 1

Criticism 2

22..



On the grid, enlarge the triangle by scale factor $-1\frac{1}{2}$, centre (0, 2)

[2]