GCSE Mathematics Practice Tests: Set 17

Paper 1H (Non-calculator)

Time: 1 hour 30 minutes

You should have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser, calculator. Tracing paper may be used.

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
  – *there may be more space than you need*.
- **Calculators may be used.**
- Diagrams are NOT accurately drawn, unless otherwise indicated.
- You must **show all your working out.**

Information

- The total mark for this paper is 80
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question*.

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Answer all questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 $w = 5y^2 - y^3$

(*a*) Work out the value of w when $y = -2$

$w =$ .....

(2)

(*b*) Factorise fully $8p^2 - 2p$

.....

(2)

(*c*) Expand $4t(3t - 2)$

.....

(2)

(*d*) Expand and simplify $(5x - 2)(x + 4)$

.....

(2)

(Total for Question 1 is 8 marks)

2 Solve $x^2 - 21x + 20 = 0$

Show your working clearly.

.....

(Total for Question 2 is 3 marks)

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3 Solve the simultaneous equations $2x + 7y = 17$

$5x + 3y = -1$

Show clear algebraic working.

$x =$ .....

$y =$ .....

(Total for Question 3 is 4 marks)

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4 (*a*) Expand and simplify $(x + 4)(x – 2)(x + 1)$

.....

(Total for Question 4 is 2 marks)

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5 (*a*) Make c the subject of $A = \frac{c}{y} - 5z$

.....

(2)

(*b*) Write down the value of g^0

.....

(1)

(*c*) Factorise $x^2 - 11x + 24$

.....

(2)

(Total for Question 5 is 5 marks)

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6 (*a*) Simplify $(3k^2)^4$

.....

(2)

(*b*) Simplify $(21m^4n) \div (3n^{-5})$

.....

(2)

(Total for Question 6 is 4 marks)

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7 Write $\frac{2x+1}{4} + \frac{x-2}{3}$ as a single fraction in its simplest form.

.....

(Total for Question 7 is 3 marks)

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8 Show that $3\frac{1}{5} \times 1\frac{5}{6} = 5\frac{13}{15}$

(Total for Question 8 is 3 marks)

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9 Simplify $(16e^{10}f^{6})^{\frac{1}{2}}$

.....

(Total for Question 9 is 2 marks)

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10 Simplify $8^2 \times \sqrt[3]{4^6}$

Give your answer in the form 2^a where a is an integer.
Show each stage of your working clearly.

.....

(Total for Question 10 is 3 marks)

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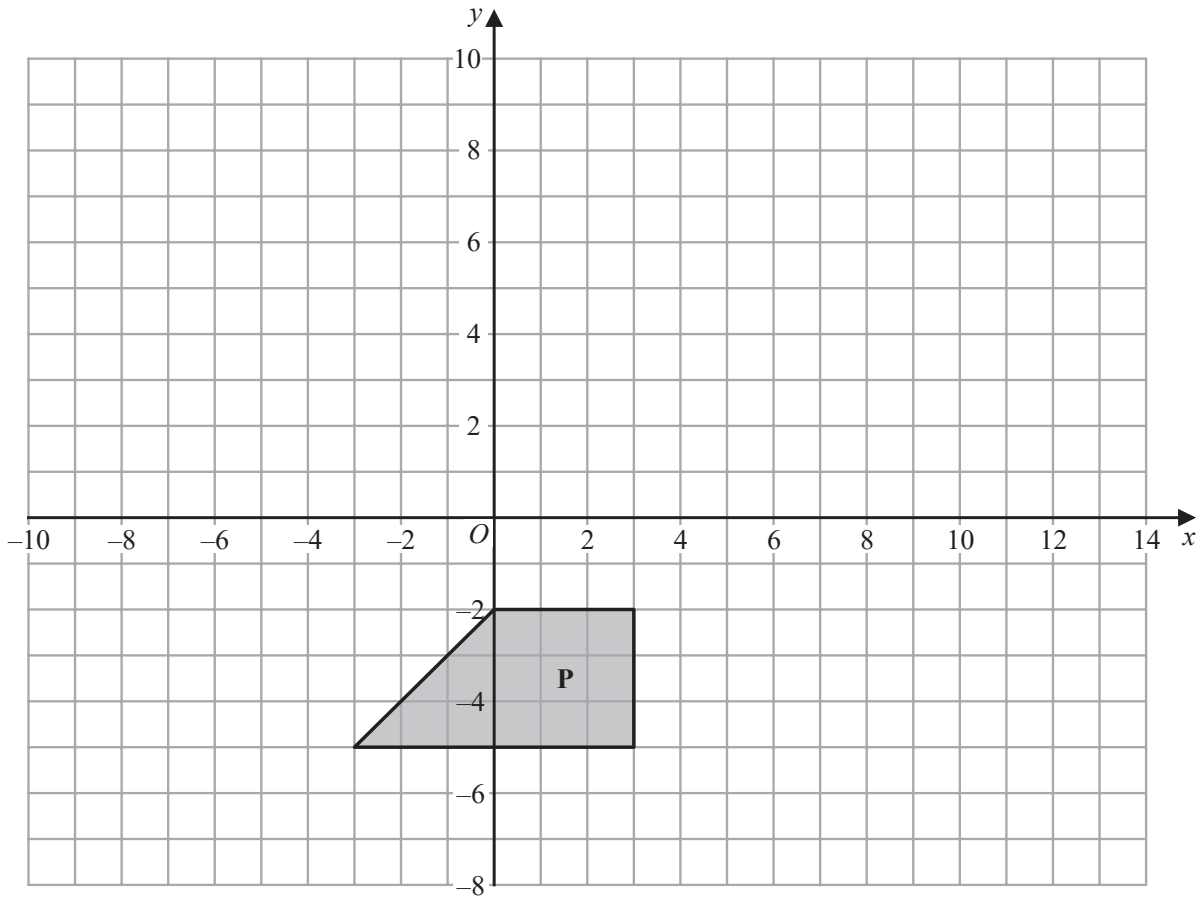
11 Here is a shape **P** drawn on a grid of squares.



(*a*) On the grid, rotate shape **P** 180° about the point (–3, 2)
Label the new shape **Q**.

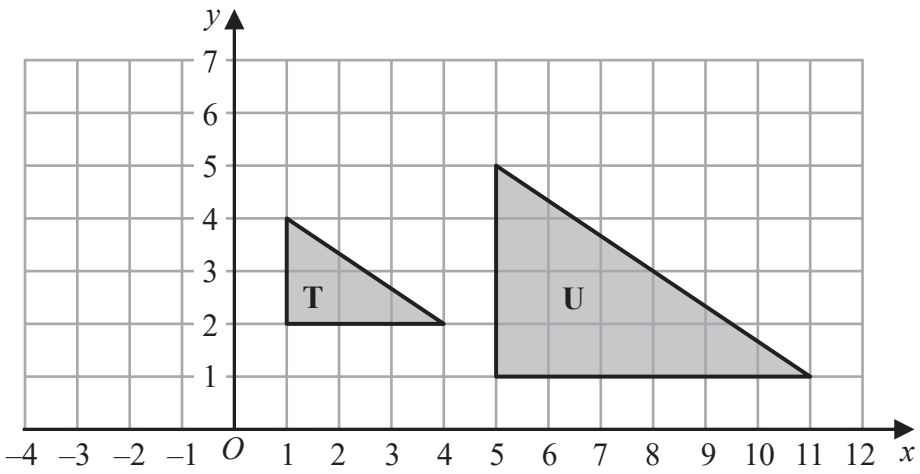
(2)

(*b*) On the grid, translate shape **P** by the vector $\begin{pmatrix} 10 \\ 8 \end{pmatrix}$

Label the new shape **R**.

(1)

Here are triangle **T** and triangle **U** drawn on a grid of squares.



(*c*) Describe fully the single transformation that maps triangle **T** onto triangle **U**.

.....

.....

(3)

(Total for Question 11 is 6 marks)

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12 Solve the equation

$$\frac{5}{x+2}+\frac{3}{x^2+2x}=2$$

Show clear algebraic working.

.....

(Total for Question 12 is 5 marks)

13 Express $x^2 - 10x + 40$ in the form $(x + a)^2 + b$, where a and b are integers.

.....

(Total for Question 13 is 2 marks)

14 Given that $n^{\left(-\frac{4}{5}\right)} = \left(\frac{1}{2}\right)^4$ where $n > 0$, find the value of n.

$n =$ .....

(Total for Question 14 is 4 marks)

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15 Use algebra to show that $4.\dot{5}\dot{7} = 4\frac{19}{33}$

(Total for Question 15 is 3 marks)

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16 Here are two vectors.

$$\overrightarrow{AB} = \begin{pmatrix} 5 \\ 3 \end{pmatrix} \qquad \overrightarrow{CB} = \begin{pmatrix} -2 \\ 4 \end{pmatrix}$$

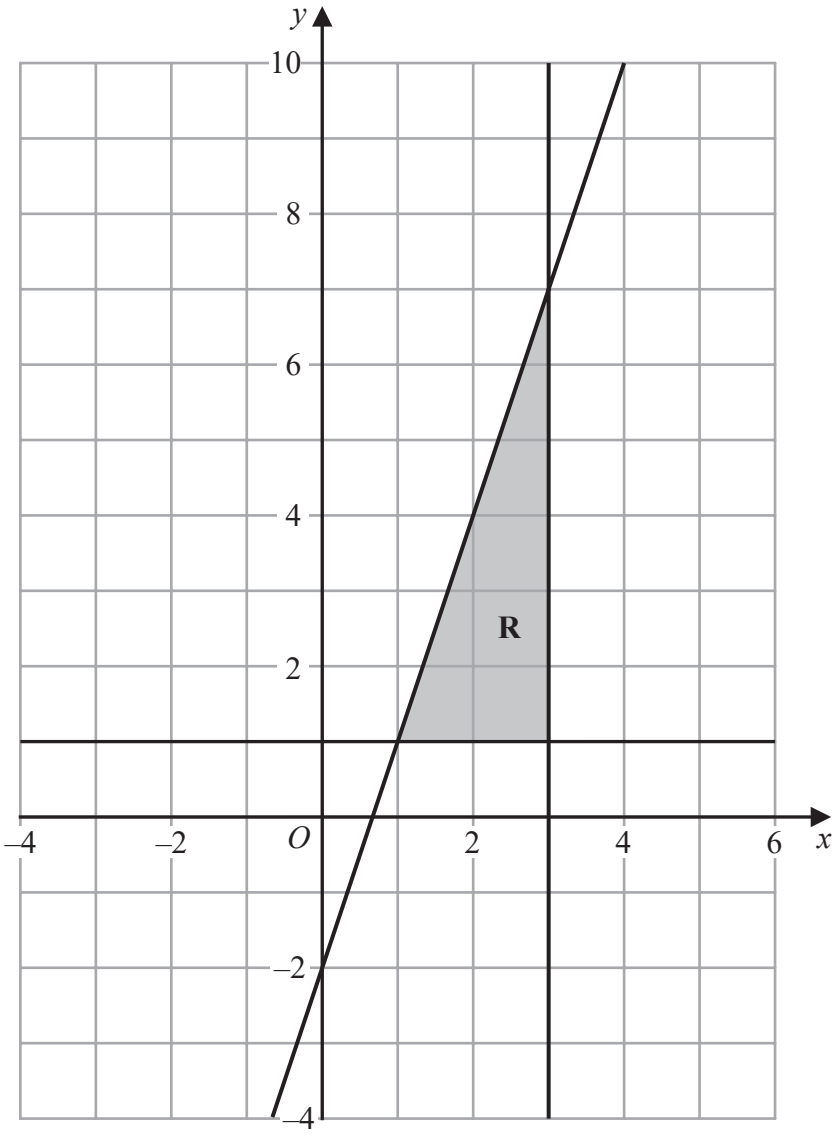
Find, as a column vector, $\overrightarrow{AC}$

.....

(Total for Question 16 is 2 marks)

17 The shaded region **R**, shown in the diagram below, is bounded by the straight line with equation $y = 3x - 2$ and by two other straight lines.

Write down the three inequalities that define region **R**.



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(Total for Question 17 is 3 marks)

18 $A = 2^8 \times 3^5 \times 11^4$ $B = 2^6 \times 3 \times 11^8$

(*a*) Find the highest common factor (HCF) of A and B.

.....

(2)

(*b*) Find the lowest common multiple (LCM) of $2A$ and $3B$.
Give the LCM as a product of powers of its prime factors.

.....

(2)

(Total for Question 18 is 4 marks)

19 Solve the simultaneous equations

$$x - 6y = 5$$
$$xy - 2y^2 = 6$$

Show clear algebraic working.

.....

(Total for Question 19 is 5 marks)

20 Given that $4^{k+3} = 16 \times 2^k$

find the value of k.
Show your working clearly.

$k =$ .....

(Total for Question 20 is 4 marks)

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21 ABC is an isosceles triangle with $AB = AC$.

B is the point with coordinates $(-1, 5)$
C is the point with coordinates $(2, 10)$
M is the midpoint of BC.

Find an equation of the line through the points A and M.
Give your answer in the form $py + qx = r$ where p, q and r are integers.

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(Total for Question 21 is 5 marks)

TOTAL FOR PAPER IS 80 MARKS

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