OCR Practice GCSE Examination Paper **Higher Set 2 Paper 4 Calculator**	**Time:** 1 hour 30 minutes	Set 2 of 10
	Standard equipment: pen, pencil, ruler, protractor, compasses, calculator. **You may use a calculator.**	
Instructions to candidates: You must show all of your working. Write all answers in the spaces provided.		

1. Adrian is buying a new radio.
    The radio is on sale.
    The sale price of the radio is 20% off the normal price.
    The radio Adrian buys is slightly damaged.
    The shop takes an extra 15% off the sale price due to the damage.
    Work out the overall percentage reduction of the price of the radio.

    _____ %   *(5)*

    Total 5 Marks

2. Simone buys 7 bags of chocolate biscuits for a total of £25.20.
    On each bag there is a label which states there are between 15 and 20 chocolate biscuits in each bag.
    Simone says that each biscuit costs 24p.

    (a) Explain how Simone reached this conclusion.
         You must show your working.

         (3)

    (b) Explain why Simone's statement may be wrong.

         (1)

    Total 4 Marks

3.   Ryan ran a game at his school fair to raise money for charity.
      He filled a bag with a mixture of blue, green and yellow counters.
      The contents of the bag could not be seen.

> **Pick a Counter**
>
> £1.50 a go
>
> Pick a yellow counter, win £3
>
> Pick a green counter, win £5

      Once a counter has been taken out of the bag, it is not replaced.
      Ryan placed 550 counters into the bag.
      65 of the counters were yellow.
      453 of the counters were blue.
   The rest of the counters were green.

      All of the yellow counters and all of the green counters were picked.
      Only some of the blue counters were picked.

      Ryan made a profit of £185 from the game.
      Work out the number of blue counters that were picked.
      You must show all of your working.

_____ *(5)*

Total 5 Marks

4. Here is a quadrilateral and an irregular pentagon.

5x + 4

5x + 2

4x

2x + 7

x + 1

2

x + 2

x + 2

2x + 3

Not Drawn Accurately
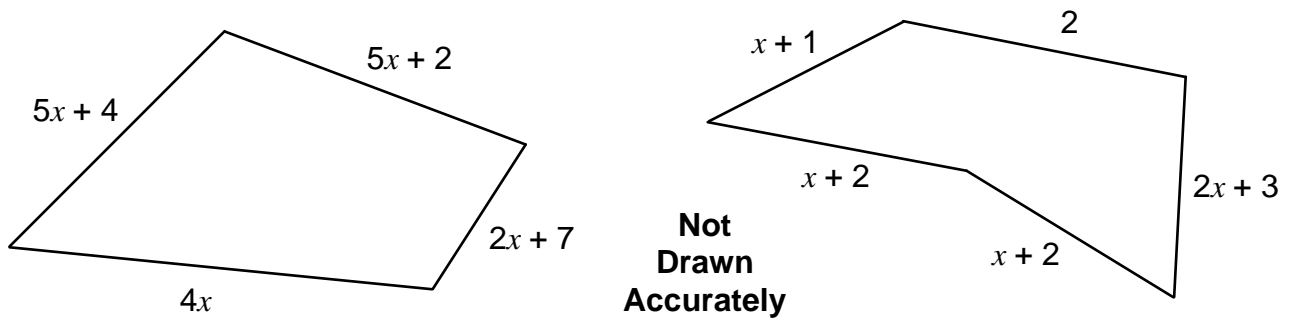
In the diagram, all measurements are in centimetres.
The perimeter of the quadrilateral is three times the perimeter of the pentagon.
Work out the perimeter of the quadrilateral.

_____ cm *(6)*

Total 6 Marks

5. Ravi recorded the number of petals on 50 different flowers in the table.

Number of petals, n	Frequency
$0 < n \leq 5$	11
$5 < n \leq 10$	15
$10 < n \leq 15$	9
$15 < n \leq 20$	7
$20 < n \leq 40$	8

Ravi drew a histogram to represent the data.
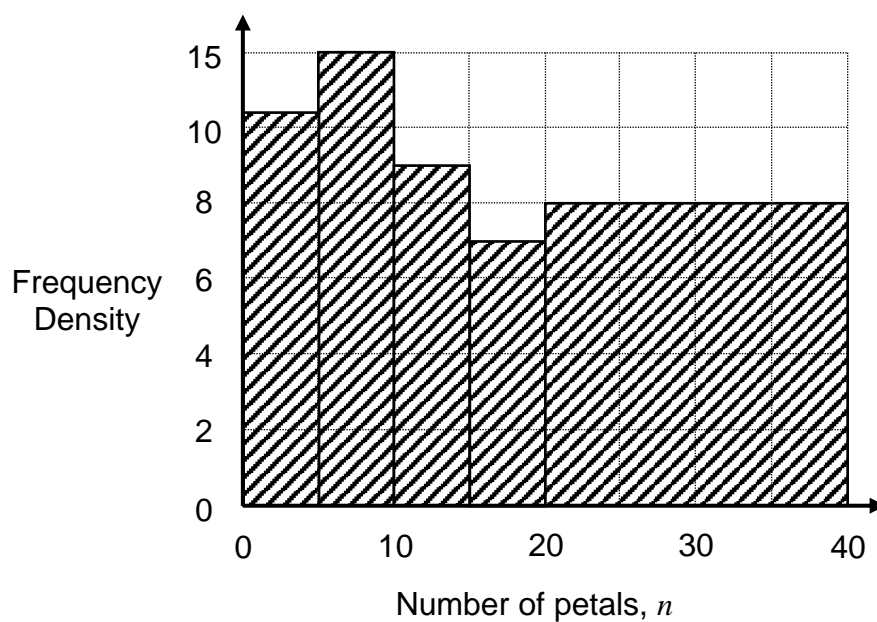
Ravi made some mistakes when drawing the histogram.
Write down **two** mistakes Ravi made.

(2)

Total 2 Marks

6. Show that:

(a) the recurring decimal $0.47\dot{2}$ can be written as $\dfrac{17}{36}$.

(3)

(b) $\dfrac{1}{2x^2+7x-15} \div \dfrac{3}{4x^2-9}$ can be written in the form $\dfrac{px+q}{rx+s}$, where p, q, r and s are integers.
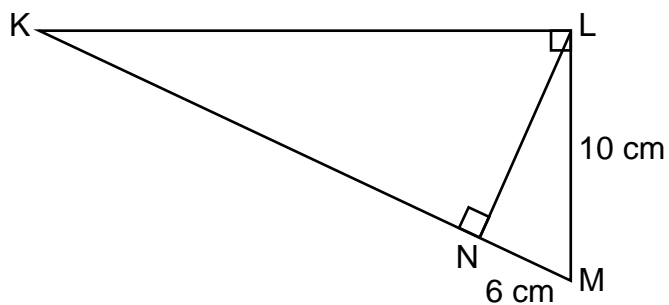
(3)

Total 6 Marks

7. $y = \dfrac{8\sqrt{x}}{3}$

Give an expression for y^2 in terms of x.

$y^2 = $ _____ *(1)*

Total 2 Marks

8. KLM is a right-angled triangle.

Not Drawn Accurately

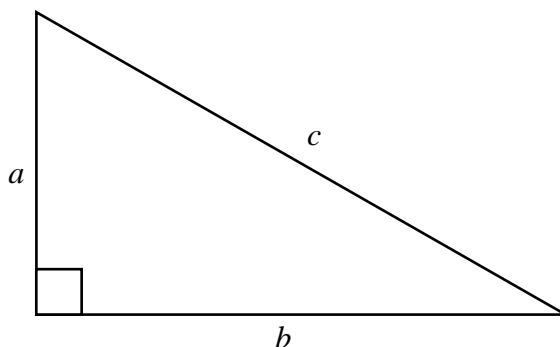N is a point on KM with KNL = 90°.
LM = 10 cm
NM = 6 cm

Calculate the length of KL.
Give your answer as a fraction in its simplest form.

_____ cm *(4)*

Total 4 Marks

9. Here is a right-angled triangle.

a is 5.31 m correct to the nearest cm.
b is 7.68 m correct to the nearest cm.

(a) Calculate the upper bound for c.
  You must show all of your working. _____ *(5)*
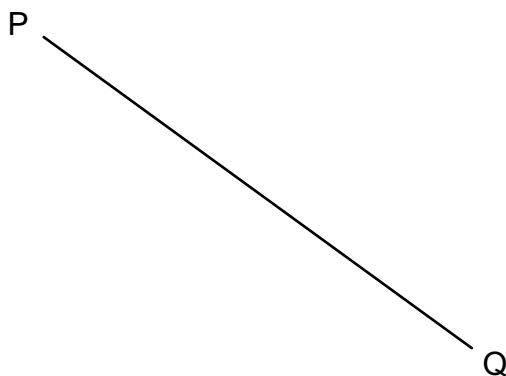
(b) Calculate an upper bound for the perimeter of the triangle.
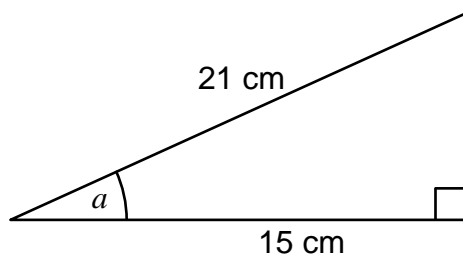 *You must show all of your working.*

_____ *(2)*

Total 7 Marks

10. Using a ruler and a pair of compasses, on the diagram below, construct the perpendicular bisector of PQ.

P

Q

Total 2 Marks

11. (a) Calculate the value of angle a.
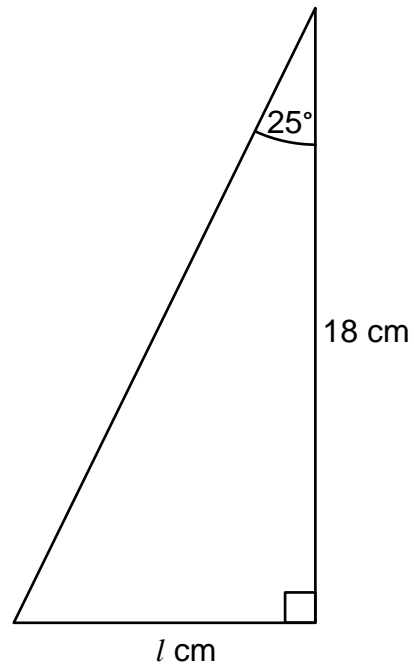*Give your answer correct to 1 decimal place.*

21 cm

15 cm

Not Drawn Accurately

_____° *(3)*

(Question 11 continues on the following page)

(b) Calculate the length l.
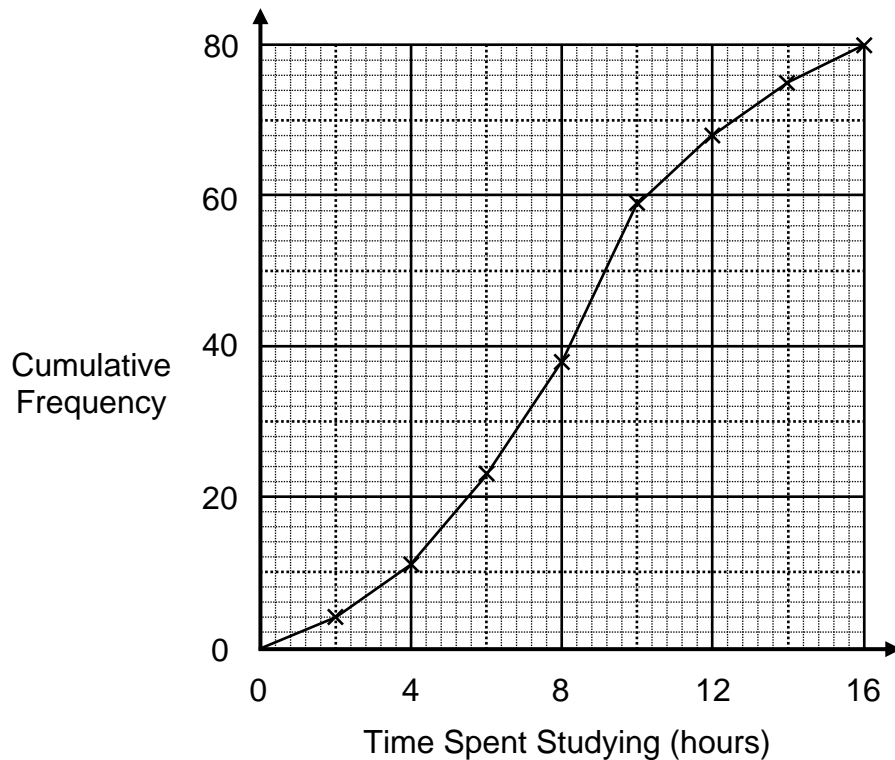*Give your answer correct to 1 decimal place.*

Not Drawn Accurately

25°

18 cm

l cm

_____ cm   *(3)*

Total 6 Marks

12. The time spent revising for a test by 80 students is shown in the cumulative frequency diagram.

(a) Work out an estimate for the percentage of students who spent 6 hours or less studying.

_____ % *(3)*

80% of students passed the test.

(b) (i) Estimate the number of students that studied for more than 9 hours and passed the test.

_____ % *(3)*

(ii) State an assumption that you made when calculating your answer to part (b)(i).
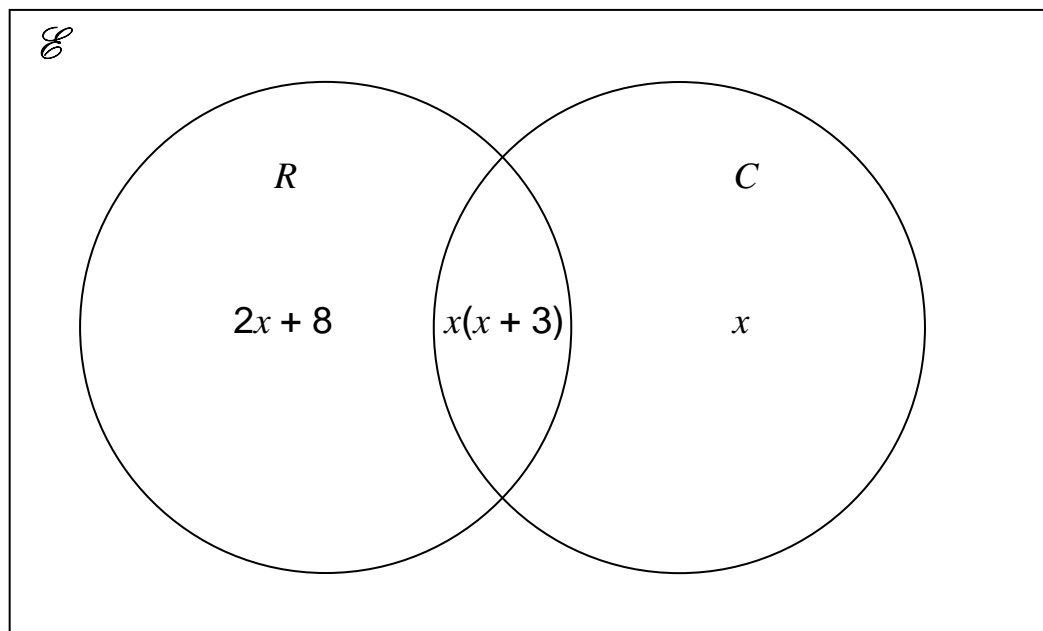
(1)

Total 7 Marks

13. The Venn diagram shows information about 80 bunches of flowers.
All bunches of flowers contain roses, carnations, or both.

$\mathscr{E}$ = 80
R = contains roses only
C = contains carnations only

A bunch of flowers is chosen at random.
Work out the probability that it contains carnations only.

_____ (5)

Total 5 Marks

14. $x_{n+1} = \dfrac{x_n^3 + 3}{5}$

(a) Starting with $x_0 = 1$, find x_1 and x_2.

$x_1 =$ _____

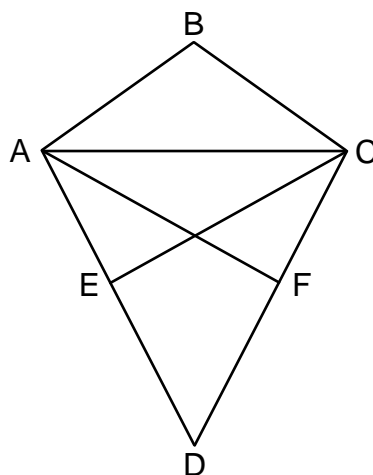$x_2 =$ _____ *(2)*

(b) Find the solution to a degree of accuracy of 4 decimal places.

_____ *(2)*

Total 4 Marks

15. ABCD is a kite.

Not Drawn Accurately

AF bisects angle CAD.
CE bisects angle ACD.

Prove that triangle ADF is congruent to triangle CDE.

Total 4 Marks

16. Triangle ABC has the properties:

        AB = 9.6 cm
        AC = 13.1 cm
        Angle ACB = 27°

(a) It is given that angle ABC is acute.
Calculate the area of triangle ABC.
Give your answer correct to 3 significant figures.

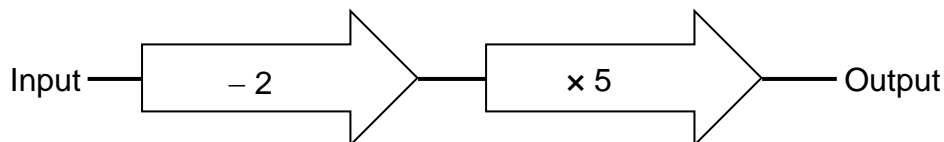   cm² *(6)*

(b) If instead it had been given that ABC is not acute, how would this have affected your working?

(1)

Total 7 Marks

17. Two functions are represented by the following function machines:
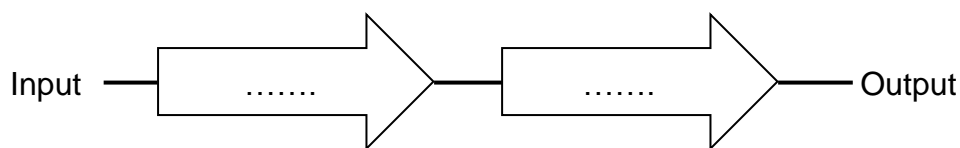
Function Machine 1:

(a) A number is input into Function Machine 1.
The output is 45.
Work out the input.

(2)

(Question 17 continues on the following page)

Inverse Function Machine 1 is shown below:

Inverse Function Machine 1:

Input —[…….]—[…….]— Output

Note: when the output from Function Machine 1 is used as the input for Inverse Function Machine 1, the output is the same as the original input from Function Machine 1.

(b)   On the function machine above, fill in the arrows to complete Inverse Function Machine 1.
You must show all of your working.
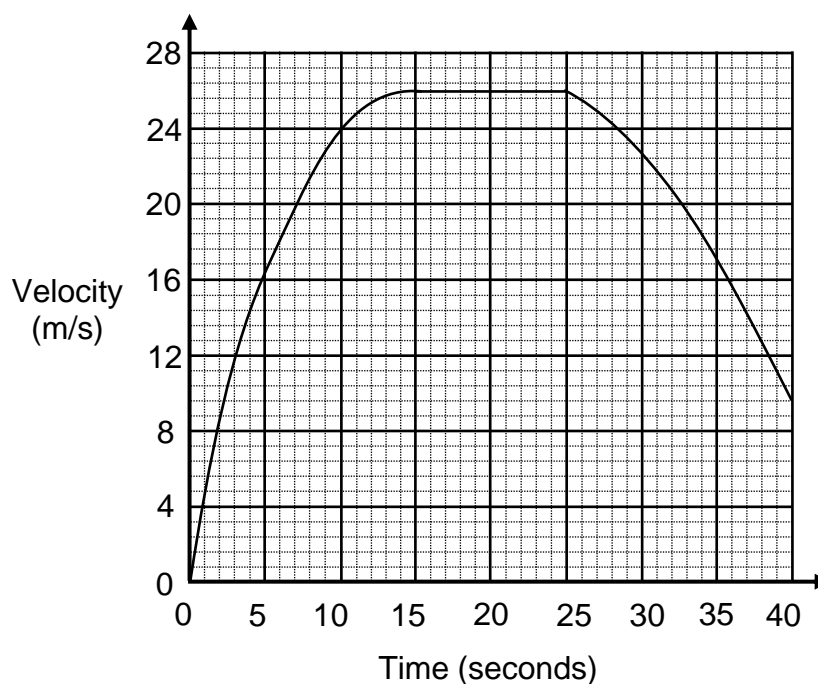
(2)

(c) x is input into Function Machine 1.
The output is used again as the second input for Function Machine 1.
Show that the second output of Function Machine 1 is $25x - 60$.

(2)

Total 6 Marks

18. The velocity-time graph for part of a journey is shown below.

(a) Estimate the deceleration at 30 seconds.
You must show all of your working.

_____ m/s² *(3)*

(b) Estimate the average speed of the journey.
You must show all of your working.

_____ m/s *(5)*

(c) Is your answer to part (b) an underestimate or an overestimate?
You must give a reason for your answer.

_____

Reason:

(1)

Total 9 Marks

19. The pressure inside a pressure cooker is set to be 1054 g/cm^2.
    You are given that

    1 kg = 2.205 pounds
    1 cm = 0.3937 inches

    Work out the pressure inside the pressure cooker in pounds per square inch.
    Give your answer correct to 2 decimal places.

    _____ pounds/inch^2 *(4)*

    Total 4 Marks

20. The number of people that live in a village at the start of year y is P_y.
    The number of people that live in the village at the start of the following year is

    $$P_{y+1} = 1.04(P_y - 32)$$

    At the start of 2016 there were 5480 people living in the village.

    (a) How many people will there be living in the village at the start of 2019?
        You must show all of your working.

    _____ *(3)*

    (b) Find the number of people who were living in the village at the start of 2015.
        Give your answer as a whole number.

    _____ *(2)*

    Total 5 Marks

    Total For Paper: 100 Marks