



16 Plus Examination

Paper 1

Maths

Total marks: [52]

Time allowed: [60]

Information for candidates

- You have 60 minutes.
- There are 52 marks available.
- Calculators are allowed.
- You must show your working.

Full name _____

1. Here are the first five terms of an arithmetic sequence.

8 13 18 23 28

Find an expression, in terms of n , for the n th term of the sequence. (2 marks)

2. Here are the first five terms of another sequence.

-2 2 6 10 14

a. Write down the next two terms of this sequence. (2 marks)

b. Explain how you found the answer. (1 mark)

c. Explain why 483 is not a term in this sequence. (1 mark)

3. Circle the decimal which is equivalent to $227/40$ (1 mark)

5.675 5.7 3.57 4.5 6.9

4. What is 20 as a percentage of 120 to two decimal places? (2 marks)

5. Which one of these is a unit of density? (1 mark)

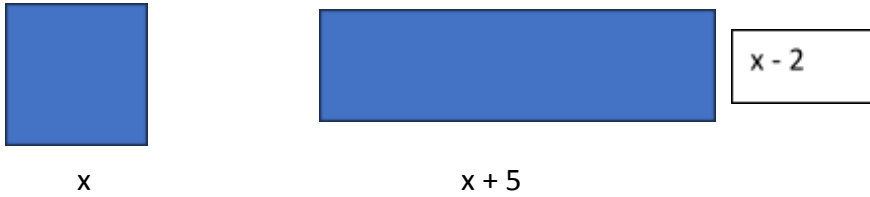
kg/m^2 g/cm^3 cm^2/kg

6. Solve the following equations (2 marks each)

a. $4(7x - 4) = 8x - 6$

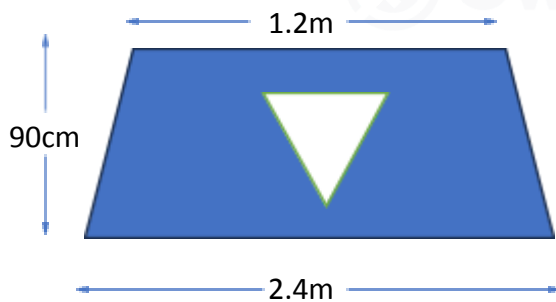
b. $10 - 5x = 6x + 3$

c. The square and the rectangle have the same area. Find the value of x .



d. $x^2 - x = 20$

7. A triangular hole is cut into a block of wood. The triangle measures 40cm at the base, and 60 cm perpendicular height. Find the percentage of the block of wood that is left. (4 marks)



8. Using the formula for the area of a cone ($A = \pi r l$ where r is the radius of the base and l is the slant height):

a) Find the area of a cone with base radius 6cm and slant height 11cm (to two decimal places)

b) Find the radius when the area is 50m^2 and $l = 6\text{m}$ (to two decimal places)

c) Find the slant height when $A = 86\text{m}^2$ and $r = 9.5\text{m}$ (to two decimal places)

Total for Question 8 = 6 marks

9. Ed is three times as old as his friend Mike. Ed is 6 years older than Mike. How old is Ed and how old is Mike? (2 marks)

10. Bilel took on a charity challenge, trying to run 100km. He tried his best but did not complete the course. His friend Simon sponsored him £3.50 for every kilometer he ran, and Bilel gave Simon £1.25 for every kilometer he did not run.

Bilel gave £214.50 to the charity. He ran k kilometers.

Write an equation in terms of k and solve it, to one decimal place. (3 marks)

11. Give both the name and the abbreviation (if appropriate) with which you would measure these objects **in the UK**: (2 marks each)

a. the mass of ten walruses

b. the width of a small table

c. the volume of water in a swimming pool

d. the mass of a bee

e. the amount of juice in a glass

12. Jenny drives to work two days a week and gets the bus three days a week. She is late for work 10% of the time when she drives, and 20% of the time when she gets the bus.

a. Estimate how often Jenny will be late over a 100 day period. (3 marks)

b. What is the probability Jenny will be late on any day chosen at random? (1 mark)

13. The variables x and y are in inverse proportion to one another. You know that when $x = 3$, $y = 20$. What is the value of y when $x = 12$? (2 marks)

14. Kim works out that the diagonals of a rectangular floor are twice as long as the shorter sides. What is the angle between a diagonal and a short side? (3 marks)



ANSWERS

1. $5n + 1$
2. a. 18, 22 b. Add 4 each time c. Numbers must be even
3. 5.675
4. 16.67%
5. g/cm^3
6. a. $x = 11/10$ b. $x = 0.5$ c. $x = 3 \frac{1}{3}\text{m}$ d. $x = -4, 5$
7. 92.6% (to 3 sig. fig.)
8. a. 207.36cm^2 b. 2.65m c. 2.88m
9. Ed is 9 and Mike is 3.
10. $3.5k - 1.25(100 - k) = 214.5$; $k = 71.5\text{km}$
11. a. Tonnes b. Centimetres (cm) c. Gallons d. Milligrams (mg) e. Millilitres (ml)
12. a. 16 days b. 0.16
13. 5
14. 60°



