13+ Mathematics Examination

The use of a calculator is **not** allowed.
Remember that marks may be given for correct working

1) $\frac{5}{6}+1\frac{1}{3}+\frac{1}{2}=$

2) $\frac{2}{5}\times 1\frac{7}{8}=$

3) Use the fact that $\frac{2}{7}\times 2\frac{1}{10}=\frac{3}{5}$ to work out

a) $\frac{3}{5}\div 2\frac{1}{10}$

b) $\frac{1}{7}\times 2\frac{1}{10}$

c) $1\frac{1}{5}\div\frac{2}{7}$

4) Use the fact that $24 \times 34 = 816$ to work out

a) $8 \cdot 16 \div 0.34$

b) $37 \times 34 - 13 \times 34$

5) Write 484 as a product of prime factors

a) Use the answer to (a) to find $\sqrt{484}$

6)

a) Increase £20 by 15%

b) The price of a TV is reduced in a sale by 30%. If the sale price is £280 what was the original price?

c) A litre of petrol cost 100p on Dec 31st. If the price increased by 15% in January and then by 20% in February, what did it cost at the end of February?

7) Write in figures the number eleven thousand eleven hundred and eleven.

8) Write **as a decimal** the answer to $\frac{3}{10} - \frac{23}{100}$

9) Solve the following equations

a) $2x - 5 = 17$

b) $\frac{2}{3}x = 12$

c) $5(7 - x) = 15$

d) $7x - 2 = 25 - 2x$

10) Simplify

a) $2a + 3b - a + b$

b) $3x^2 + x^2$

c) $2a^2b \times 3abc^3$

d) $\dfrac{6x^2yz^3}{2xy^2z}$

11) If 6 Hong Kong dollars can be exchanged for 80 Japanese Yen, how many dollars can be exchanged for 200 Yen?

12) Roughly how many minutes are there in 100 years:

500,000,000 or 50,000,000 or 5,000,000 or 500,000?

13) If 3 dogs eat 3 bags of dog-food in 3 days, how long will it take 4 dogs to eat 8 bags of dog-food?

14) The average weekly wage of a group of 10 people is £350. If the highest paid person is not included, the average wage is £300. What is the weekly wage of the highest paid person?

15) Find two numbers whose sum is 1 and whose product is -12

16) I have two spinners, a blue one marked with the numbers 1, 3 and 5 and a red one with the numbers 2, 4 and 6

a) List all the possible results from both spinners
(starting with blue =1, red = 2)

b) What is the probability that the red score is less than the blue score?

17) There are 12 inches in one foot and 3 feet in one yard.

a) How many inches in one-quarter of a yard?

b) Add together 2 feet 8 inches, 1 foot 7 inches and 2 feet 11 inches, giving your final answer in yards, feet and inches.

18) Find the next two numbers and the 50^{th} number in these sequences

a) 1, 5, 9, 13, ….. …..

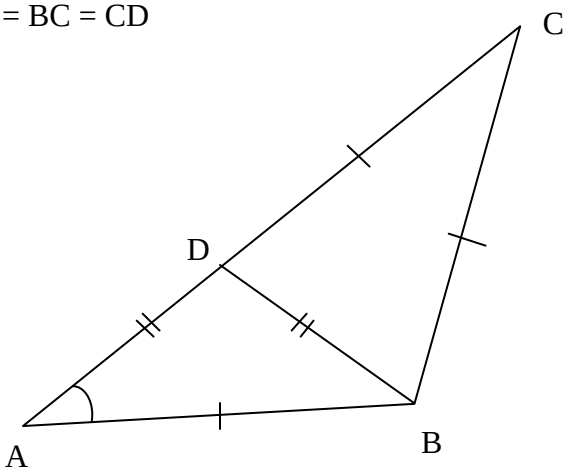
b) 6, 7, 4, 2, 6, 7, 4, 2, 6, ….. …..

19) If the n^{th} number in a sequence is given by the formula $n^2 - 5$, write down the first three terms and the 100^{th} term.

20) In this diagram AB = BC = CD

and AD = DB

Find the angle at A



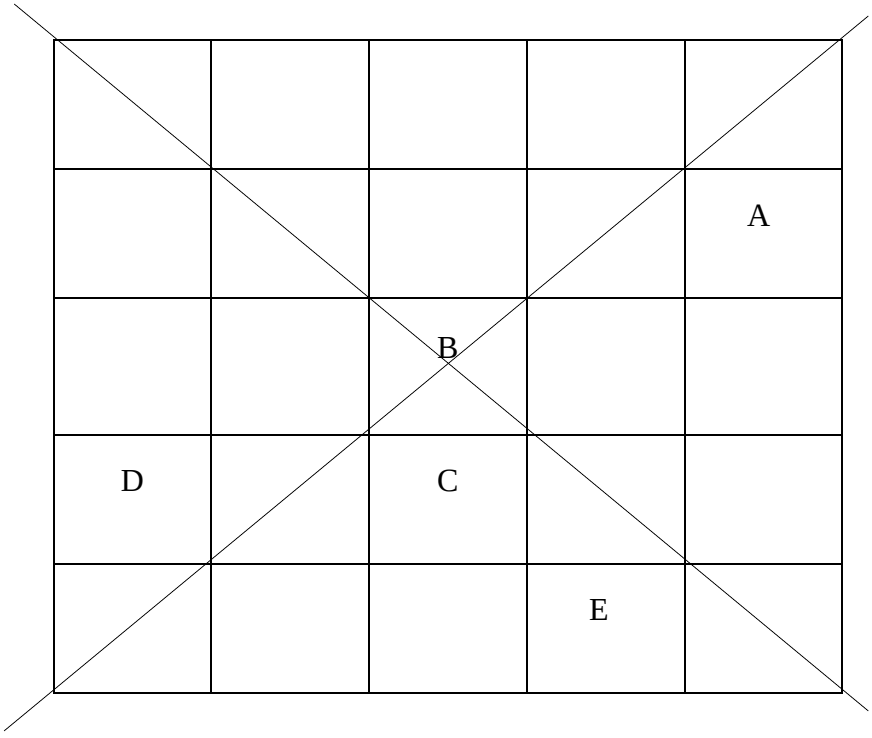
21) *a*, *b* and *c* are positive whole numbers, not necessarily different from each other.

Find as many solutions as you can to

$$\frac{1}{a}+\frac{1}{b}+\frac{1}{c}=1$$

(The same numbers in a different order is <u>not</u> a different solution)

22) In this square each row, each column and the two main diagonals (shown by dotted lines) contains each of the letters A, B, C, D and E exactly once. Fill in as many missing letters as you can.



23) Four friends, Andrew, Bob, Chris and David, all have different heights. The sum of their heights is 670 cm.

Andrew is 8cm taller than Chris and Bob is 4cm shorter than David.

The sum of the heights of the tallest and shortest of the friends is 2cm more than the sum of the heights of the other two.

Find the height of each friend.