Mathematics Entrance Exam

24th June 2020

Time: 8:00 – 10:00

*Name:*_____   *Index number:* _____

INSTRUCTIONS TO CANDIDATES

- Answer all questions
- Do all your working in the space provided next to each question

1.   (4 marks)

Work out the value of:

(i) $4^{-1} + 4^2 - 4^0$ (ii) $3^4 \times 3^{-7} \div 3^{-5}$

2.   (2 marks)

Without using the calculator, find the value of: $66^2 - 34^2$

3. (2 marks)

A book- shelf is 2m long. If each book is 2.5 cm thick,

Find how many books can fit on the shelf.

4. (2 marks)

Write down the next term of the sequence:

(i) BE, CF, DG, _____   (ii) 2/3, 4/5, 6/7, _____
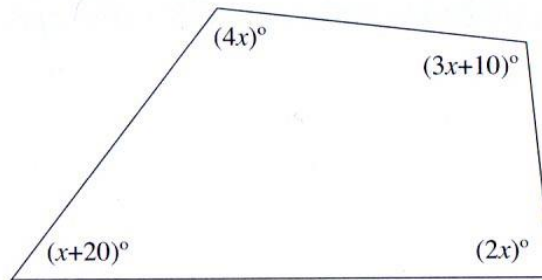
5. (2 marks)

Find the square number between 40 and 50:

6. (2 marks)
Find the value of: $(\sqrt{8})^2$

7. (2 marks)
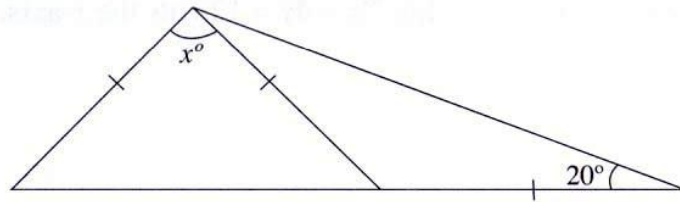
Find the value of x:

8. (2 marks)

In a class 3/5 of the children are boys. If there are 12 girls, how many children are there in the class?

9. (2 marks)

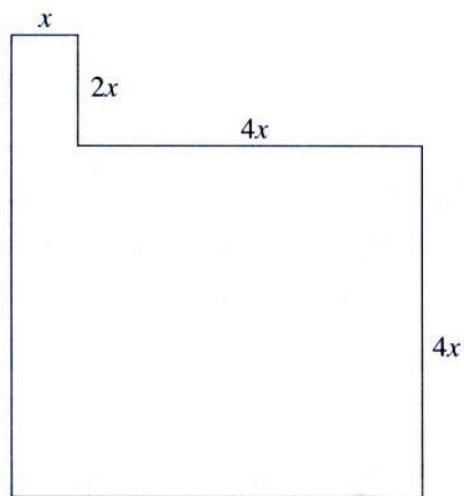Mark the values of all the angles in the diagram.

Then find the value of x.

10. (2 marks)

The perimeter of the given diagram is 264 cm.
Find the value of x in cm.

11. (3 marks)

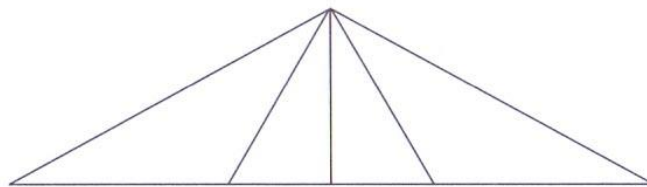In the equation $3bc + d = 5$; if $c = 3$ and $d = 2$, what is the value of b?

12. (3 marks)

Mark all the points in this diagram with the letters A B C D E F;

Then name all the triangles - example *ABC* .

How many triangles are there in all? _____

13. (10 marks)

When $a = -1$ and $b = -2$. Find the value of:

(i)   2 (a – b)

(ii)   5 (2 a + b)

(iii) $5 - 2(3a + 2b)$

14.   (12 marks)

Simplify the following:

(i) $a^{1/2} \times a^{3/4} \times a^{-1/4}$

(ii) $m^{5/4} \div m^{1/4} \div m^{-1/2}$

(iii) $a^{2/3} b^{-1/5} \times a^{1/3} b^{-4/5}$

(iv) $c^{1/3} d^{2/5} \div c^{1/3} d^{-3/5}$

15.   (6 marks)

Write the value of:

(i) $(1/8)^{1/3}$

(ii) 4^{-3}

16. Solve the equation: $\dfrac{3x-2}{5} + \dfrac{x+2}{2} = 5$ (4 marks)

17. (i) A car dealer sells a car for € 25.000, making a profit of 25%.   (7 marks)

Find this amount of profit.

(ii) Mary received a 10% rise in her salary. Her new salary is € 6.600.

What was her original salary?

18. (4 marks)

Mr Jordan bought a flat for a certain amount of money.

He had to spend one-fifth (1/5) of that amount, on repairs.

The total cost was €120.000. How much did he pay for the flat?

19.   (7 marks)
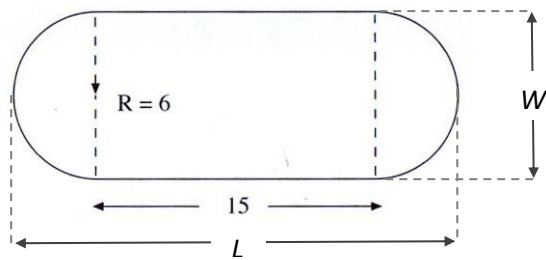
A certain mother is three times as old as her daughter **now**.

Eight years ago the sum of their ages was 40.

Find the age of the **daughter now**.

20. (12 marks)

An investor bought a plot of land like the diagram below; consisting of 2 semicircles of radius 6m and a rectangle of length 15m.

(i) What is the total length L of the property?

(ii) What is the width W of the property?

(iii) What is the perimeter of the property?

(iv) What is the surface area of the property?

(v) The cost of land is € 150/m². How much did the buyer pay for the land?

(vi) The boundary wall is 1.5m high. What is the surface area of the wall?

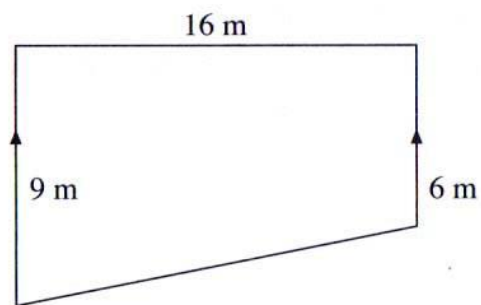21.   (10 marks)

A swimming pool is 16m long and 12m wide.

One side of the pool is 6m deep and the other side is 9m deep.

The given diagram represents the cross-section of the pool.

(i) Calculate in m³, the volume of water in the pool when it is full.

(ii) If water is pumped into the pool at the rate of 0.1m^3 per minute, how long does it take to fill the pool?

(iii) Given that the weight of water is 1000kg/m^3, calculate the weight of water when the pool is **2/3 full**.

End of Paper – Good Luck