## QUARTER FINALS 1

1. Two fair dice are thrown once. Express as a common fraction reduced to the lowest term, **the probability that different numbers appear.**
   **Ans:** $\frac{5}{6}$ **[SHORT WORK – 10 Sec]**

2. Mr Addison has asquare farmland with a semi-circular field attached to one side, so that its diameter is equal to the length of the square. If the diagonal of square is $\sqrt{450}$ meters. Find **(in terms of pi)** the ratio of the area of the semicircle to the area of the square.
   **Ans:** $\frac{\pi}{8}$ **or** $0.125\pi$ **[LONG WORK – 30 Sec]**

3. How many different ways can your Science and Maths Teachers arrange two out four students to represent your school in the BBQ National competition?
   **Ans: 12 ways** **[SHORT WORK – 10 Sec]**

4. Mr Adu made a profit of 8% after he sold a laptop at 20% discount on the marked price. What is the ratio of marked price to the cost price of the laptop?
   **Ans: ratio is 20:27** **[LONG WORK – 30 Sec]**

5. How many elements belong to the following set.$G = \{x: x \in R \text{ and } 1 + x^2 = 0\}$
   **Ans:No element** or **G is an empty set** **[SHORT WORK – 10 Sec]**

6. A man walks around a regular polygonal playing field of side 12 meters in 5 minutes. If the exterior angle of the field is **24°**, calculate (**to two decimal places**) his rate of movement in kilometres per hour.
   **Ans: 2.16 Km/h** **[LONG WORK – 30 Sec]**

7. Stephen has two children. The sum of the squares of their ages is 250 and the product of their ages is 117. Find the sum of their ages after fifteen years.
   **Ans: 52years** **[LONG WORK – 30 Sec]**

8. A teacher asked her student to write down all positive integers between 150 and 2000. How many perfect cubes did the student write down if the work was done correctly?
   **Ans: 7** **[SHORT WORK – 10 Sec]**

9. Rickygot a total amount of GHC 4200 after investing GHC 1800 at 17.92% per annum simple interest over a specific time interval. Find the simple interest on an amount of GHC2700 at the same rate and time interval.
   **Ans: GHC 3600** **[LONG WORK – 30 Sec]**

10. The Highest common factor of 18 and another number is 2, however their Least Common Multiple is 72. What is the other number?
    **Ans: 8** **[SHORT WORK – 10 Sec]**

**X – FACTOR**

**(3 MINUTES)**

Motion is one of the dynamic topics in physics. It is the phenomenon in which an object changes its position or direction over time.
It is associated with physical quantities like distance, speed, time, acceleration etc.

Speed is te distance covered by a moving body over time spent whereas acceleration is the speed at which a body in motion moves over the time spent.

The relation connecting the distance$\boldsymbol{x}$**,** time $\boldsymbol{t}$**,** acceleration $\boldsymbol{a}$**,** and initial speed $\boldsymbol{u}$**,** of a body in motion is given by

$$\boldsymbol{x = ut + at^2}$$

If Alexander's school is **3km** from his house and his father drove him from the house one morning at 6:22am, at what rate did the car accelerate if:

**A.** his father took off from the house at a speed of $\frac{10}{9}\boldsymbol{m/s}$ and got to the school at $\boldsymbol{6{:}37am}$.

**B.** his father took off from the house at a speed of $\frac{5}{6}\boldsymbol{m/s}$ and got to the school at $\boldsymbol{6{:}42am}$