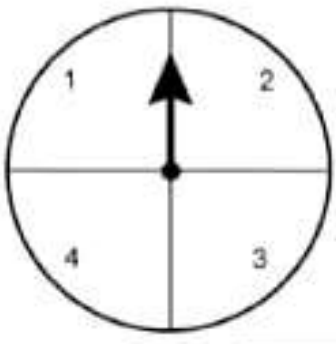
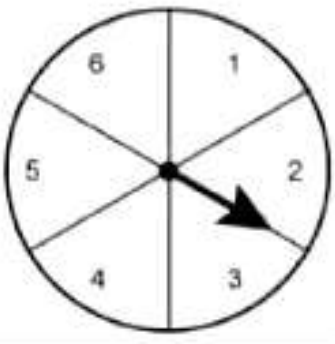
1. A boy makes rectangular boxes using cards. He made one small box measuring 6cm long, 5cm wide and 8cm tall. He made a bigger one 12cm long, 10cm wide and 16cm tall.
   a) How many times as much card did he use to make the big box as used for the small box? Explain.
   b) Determine the number of times the volume of the big box is as large as the small box.
   c) If the card cost GH¢ 1.50 for a 10cm by 10cm square card, how much was spent on making the big box.

2. A group consisting of 3 adults, 5 teenagers, and 4 young children stops at a restaurant on the way home from a football tournament. Rather than figuring out each person's 35 of an adult's share, and each child's share would be 13 of an adult's share. If the total cost of the meal was GH¢66.00, what was the share of the family that consisted of an adult and two young children?

3. A rectangular playing is 20 metres long. A straight path is cut across the field along one of its diagonals. If the length of the path is 25 metres, how wide is the playing field?

4. If the two spinners below are spun simultaneously, what is the probability that the sum of the results will be greater than or equal to 7?





5. Developing students' fundamental knowledge and understanding of mathematical concepts is an important goal of teaching mathematics. Explain **FOUR** classroom practices a mathematics teacher has to use in order to increase students' chances of achieving this aim in Ghanaian schools.

Q1 (a) For small box $L = 6cm$ $w = 5cm$ $H = 8cm$

Total surface area $= 2(6\times5) + 2(6\times8) + 2(5\times8)$

$= 60 + 96 + 80$

$= 236cm^2$

For big box, $L = 12cm$ $w = 10cm$ $H = 16cm$

Total surface area $= 2(12\times10) + 2(12\times16) + 2(10\times16)$

$= 240 + 384 + 320$

$= 944\,cm^2$

Comparing the two surface areas,

i.e. $\frac{944cm^2}{236cm^2} = 4.$

This implies that he used 4 times as much card for the small box to make the big box.

(b) Volume of small box $= 6\times5\times8$

$= 240cm^3$

Volume of big box $= 12\times10\times16$

$= 1920\,cm^3$

$\frac{\text{Volume of big box}}{\text{Volume of small box}} = \frac{1920cm^3}{240cm^3} = 8.$

∴ The volume of the big box is 8 times larger than the volume of the small box.

(c) Implies for every $10cm\times10cm$

that is $100cm^2 = GH¢1.50$

$944cm^2 = \frac{944}{100} \times GH¢1.50$

$= GH¢14.16$

Q2

Adults = 3
Teenagers = 5
Young children = 4
Let adult be x
Teenagers = $\frac{3}{5}x$
children = $4 \times \frac{1}{3}x = \frac{4}{3}x$

$x + \frac{2}{5}x + \frac{4}{3}x = 66$

$15x + 9x + 20x = 990$

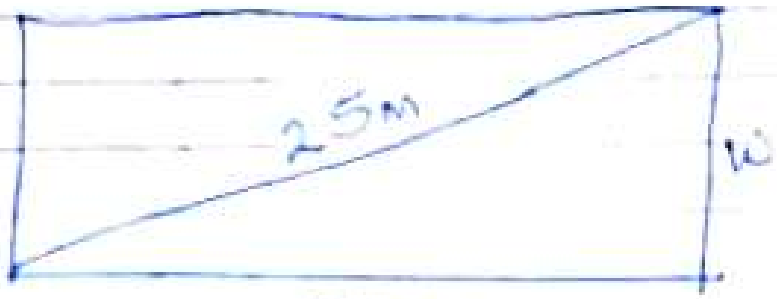
$\frac{44x}{44} = \frac{990}{44}$

$x = 22.5$

Adults share = GH₵ 22.50
Young children = $\frac{4}{5}x = \frac{4}{5} \times 22.5$
= GH₵ = 30

⇒ An adult and 2 young children
= GH₵ 22.50 + 2(GH₵30)
= 22.5 + 60
= 82.5
GH₵ = 82.50

Q3



let the width = w

Using Pythagoras theorem.

$\Rightarrow 25^2 = 20^2 + w^2$

$625 = 400 + w^2$

$w^2 = 625 - 400$

$w^2 = 225$

$w = \sqrt{225}$

$w = 15$

∴ the width = 15metres

4) Sample Space (outcome)

	1	2	3	4
1	1,1	1,2	1,3	1,4
2	2,1	2,2	2,3	2,4
3	3,1	3,2	3,3	(3,4)
4	4,1	4,2	(4,3)	(4,4)
5	5,1	(5,2)	(5,3)	(5,4)
6	(6,1)	(6,2)	(6,3)	(6,4)

$n(S) = 24$

let A be the event that the sum will be greater or equal to 7.

$n(A) = 10$

$$P_r(A) = \frac{n(A)}{n(S)} = \frac{10}{24}$$

$$= \frac{5}{12} //$$