Clue 1

- To solve this clue, players will first need to find the unknown angles listed on The Big Top clipboard on the blueprint of The Big Top using what they know about angle relationships. See steps below.

To find ∠BOC:

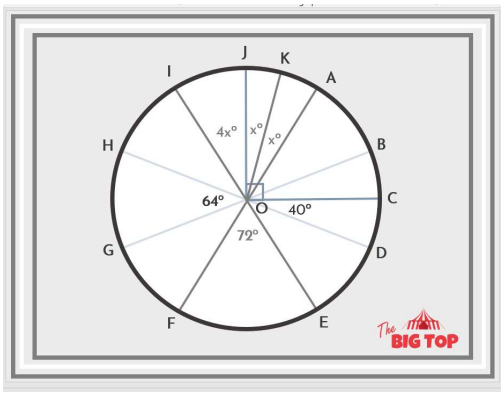
∠GOH = ∠BOD
∠GOH = ∠COD + ∠BOC
64° = 40° + ∠BOC
64° - 40° = 40° - 40° + ∠BOC
24° = ∠BOC

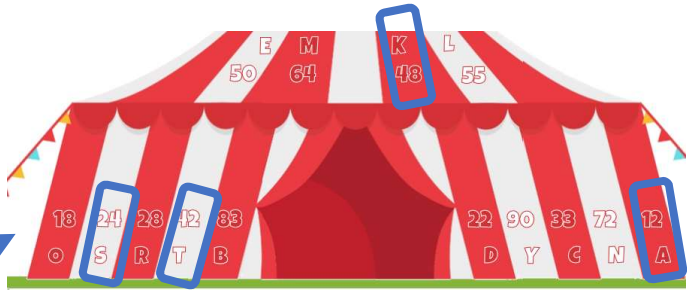
To find ∠IOJ, ∠KOA & ∠JOA:

∠IOJ + ∠JOA = ∠EOF
∠IOJ + ∠JOK + ∠KOA = ∠EOF
4x° + x° + x° = 72°
6x° = 72°
$\frac{6x°}{6} = \frac{72°}{6}$
x = 12°
Therefore, let x = 12°,
∠KOA = x° = **12°**
∠IOJ = 4x° = 4(12°) = **48°**
∠JOA = x° + x° = 2x° = 2(12°) = **24°**

To find ∠AOB:

Know that ∠JOC = 90°
Therefore,
∠JOA + ∠AOB + ∠BOC = 90°
24° + ∠AOB + 24° = 90°
48° + ∠AOB = 90°
48° - 48° + ∠AOB = 90° - 48°
∠AOB = 42°





Once the unknown angles are found, these values can be matched to letters on the big top tent picture.

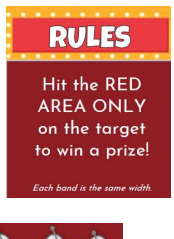
When these corresponding letters are placed in the same order as the angles are listed on the big top clipboard they provide the combination for the **TEXT LOCK: TASKS**.

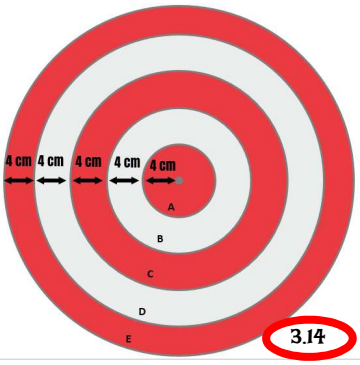
Order of Angles	Value	Matching Letter
∠AOB	42°	T
∠KOA	12°	A
∠BOC	24°	S
∠IOJ	48°	K
∠JOA	24°	S

Clue 2

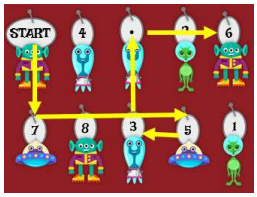
To solve this clue, players need to find the size of the red area only on the bullseye, as indicated on the rules picture. To do so, they will first need to find the radii using the information that the diameter of the entire bullseye is 40 cm and that each band width is the same. Dividing the diameter by the number of bands all the way across gives the width as: 40 cm ÷ 10 bands = 4 cm per band. Using this information: r_E = 20 cm, r_D = 16 cm, r_C = 12 cm, r_B = 8 cm and r_A = 4 cm. The red area may then be calculated as follows:

$Area_{Red} = Area_E - Area_D + Area_C - Area_B + Area_A$
$A_{Red} = \pi r_E^2 - \pi r_D^2 + \pi r_C^2 - \pi r_B^2 + \pi r_A^2$
$A_{Red} = 3.14(20)^2 - 3.14(16)^2 + 3.14(12)^2 - 3.14(8)^2 + 3.14(4)^2$
$A_{Red} = 3.14(400) - 3.14(256) + 3.14(144) - 3.14(64) + 3.14(16)$
$A_{Red} = 1256 - 803.84 + 452.16 - 200.96 + 50.24$
A_{Red} = 753.6 cm²





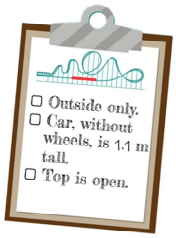
Finally, players will locate the digits & decimal from the answer, 753.6, in order on the alien prize board. This will provide the order for the **DIRECTION LOCK: DOWN-RIGHT-LEFT-UP-RIGHT.**



NOTE: THE 3.14 AT THE BOTTOM OF THE POSTER IS A HINT FOR PLAYERS TO USE THIS ESTIMATE FOR π.

Clue 3

As hinted on the To Do List clipboard, players need to find the AREA of one roller coaster car. To solve this clue, players will need to find the surface area (SA) of the outside of the roller coaster to be painted. The roller coaster car is the shape of a right trapezoidal prism. Players will also find a few notes on a second roller coaster clipboard, which gives them the height of the car as 1.1 m, reminds them it is the outside surfaces only being painted, and that there is no top on the roller coaster car. See the steps below for how to find the surface area.

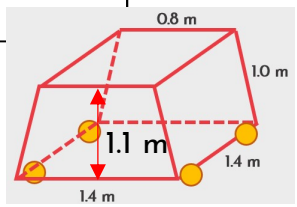


$SA_{trap\ prism} = 2A_{trap} + 2A_{side\ rect} + A_{bottom}$
$SA_{trap\ prism} = 2(1.21) + 2(1.4) + 1.96$
$SA_{trap\ prism} = 2.42 + 2.8 + 1.96$
$SA_{trap\ prism} = 7.18\ m^2$

←See additional steps if necessary→

$A_{trap} = (l \cdot w) + 2(\frac{1}{2}bh)$
$A_{trap} = (0.8 \cdot 1.1) + 2(\frac{1}{2} \cdot 0.3 \cdot 1.1)$
$A_{trap} = 0.88 + 0.33$
$A_{trap} = 1.21\ m^2$

The digits in the surface area, 7.18, provide the combination for the **3-DIGIT LOCK: 718**.

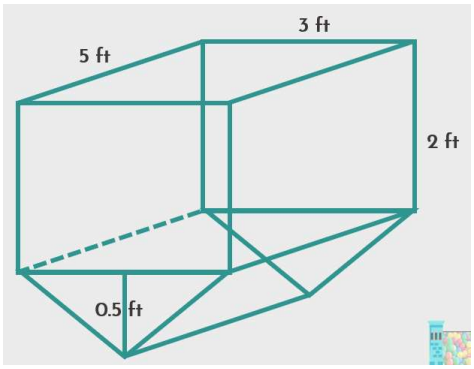


$A_{side\ rect} = l \cdot w$
$A_{side\ rect} = 1.4 \times 1$
$A_{side\ rect} = 1.4\ m^2$

$A_{bottom} = l \cdot w$
$A_{bottom} = 1.4 \times 1.4$
$A_{bottom} = 1.96\ m^2$

Clue 4

As indicated on the master to do list, players need to find out if there are enough balls for the new ball pit. The ball pit clipboard tells players that there are 35 cubic feet of balls already at the amusement park. To find out if this is enough, players will need to calculate the volume of the new ball pit using the dimensions given on the ball pit blue print. See steps below. The digits in the volume, 3375, provides the combination for the **4-DIGIT LOCK: 3375**.



$V_{total} = V_{rect\ prism} + V_{tri\ prism}$
$V_{total} = l \cdot w \cdot h + \frac{1}{2}\ bh \cdot h$
$V_{total} = (5 \times 3 \times 2) + (\frac{1}{2} \times 3 \times \frac{1}{2} \times 5)$
$V_{total} = 30 + 3.75$
$V_{total} = 33.75\ ft^3$