



## MATHS AT O'BRIEN GROUP ARENA

Grades 9 & 10

As a hockey player, it is important to be able to score goals on the net and help your teammates getting goals, too! Points are given to players to track how valuable they are to a team throughout the season.

Two points are gained by scoring on a goal yourself, one point is given when you assist a teammate in getting a goal, and two points taken away when the opposition scores against you.

Competing with a friend, see who can get the most points to win the Stanley Cup!

### To play the game:

- Get a set of **three dice** and roll them **all together**
- You get 5 rolls each round
- If the sum of the dice is between or including 3 and 10, opposition scored against you while you were on the ice! **Take away two points**
- If the sum of the dice is between or including 11 - 18, a team mate scored a goal with your assistance! **Give yourself +1 point**
- When you land a double or triple, you have scored a goal! **Add +2 points to your score**
- Jot down how many points you get throughout the round then add them up,
- The player with the highest amount of points wins!

#### Example:

*Amy rolls 2,3,6 ~ 4,3,2 ~ 5,5,1 ~ 1,2,3 ~ 6,4,3 = 11 ~ 9 ~ Doubles ~ 6 ~ 13*

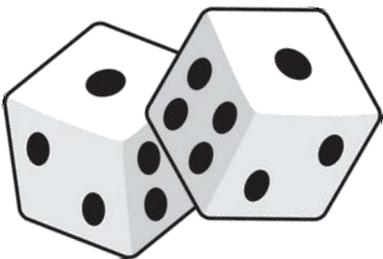
	Points awarded / lost					TOTAL
Example:	+1	-1	+2	-1	+1	+2
Round 1						
Semi Final						
Grand Final						
					TOTAL:	



What is the total number of outcomes when rolling three dice at once?

Draw a tree diagram to illustrate the probability of rolling double numbers in one roll

What is the probability of rolling double numbers in one roll?





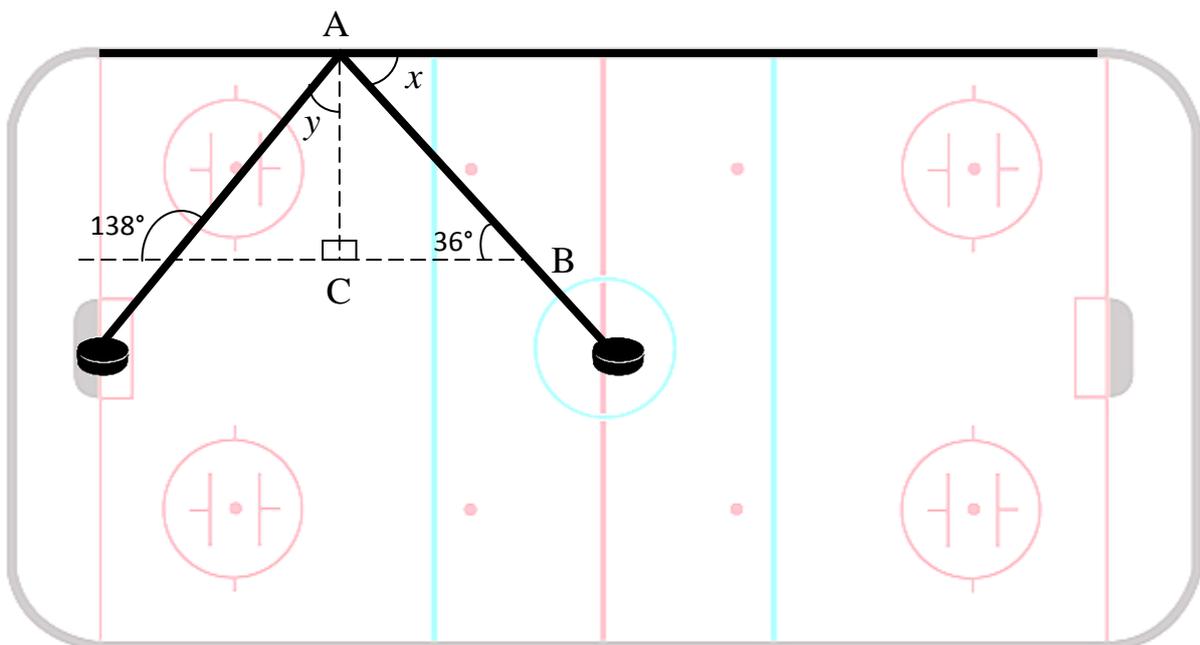
# O'BRIEN GROUP ARENA

Jared is practicing scoring goals using angles off the boards.

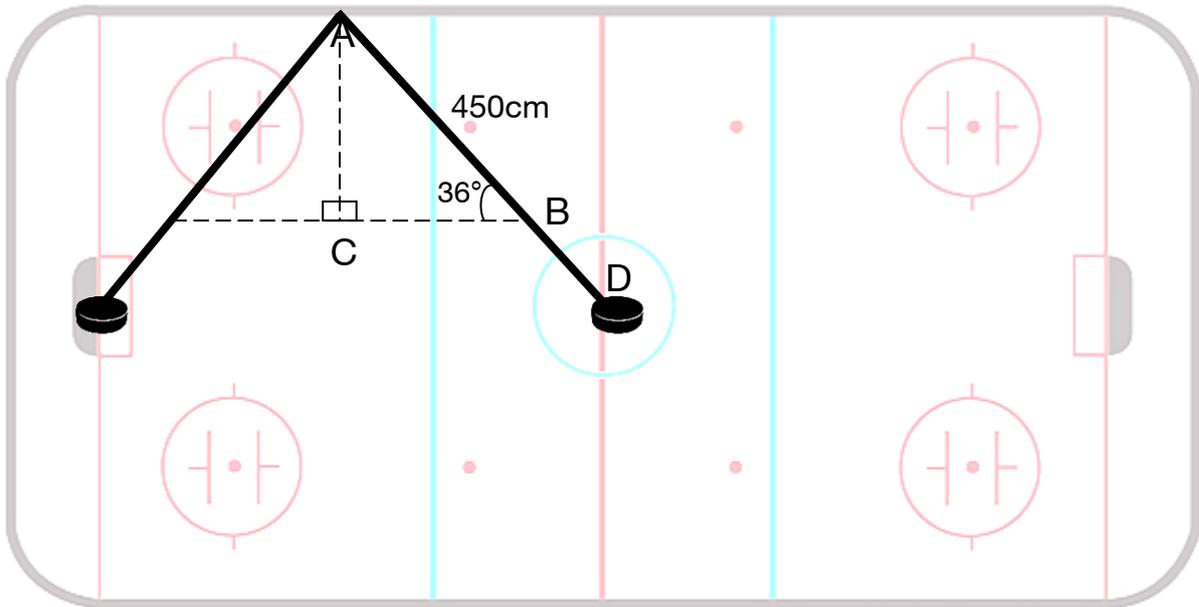
1. Calculate the angle at which the puck hits the boards and goes into the net ( $x$ ).



2. Using this answer, and the other angles given, calculate angle  $y$ .



Geometry: Angle Properties



3. If James is standing at point D, write down his compass and true bearings from point D to point A

4. Given the length of line AB, determine the length of CB. Give your answer in *metres* and to two decimal places.



# O'BRIEN GROUP ARENA

During an AHL match, there are 983 seats in the O'Brien Group Arena grandstand.

If 63 of these are reserved for VIP and 189 seats have been pre-purchased

1. Write an equation to solve for  $x$ , where  $x$  is the amount of remaining seats in the grandstands

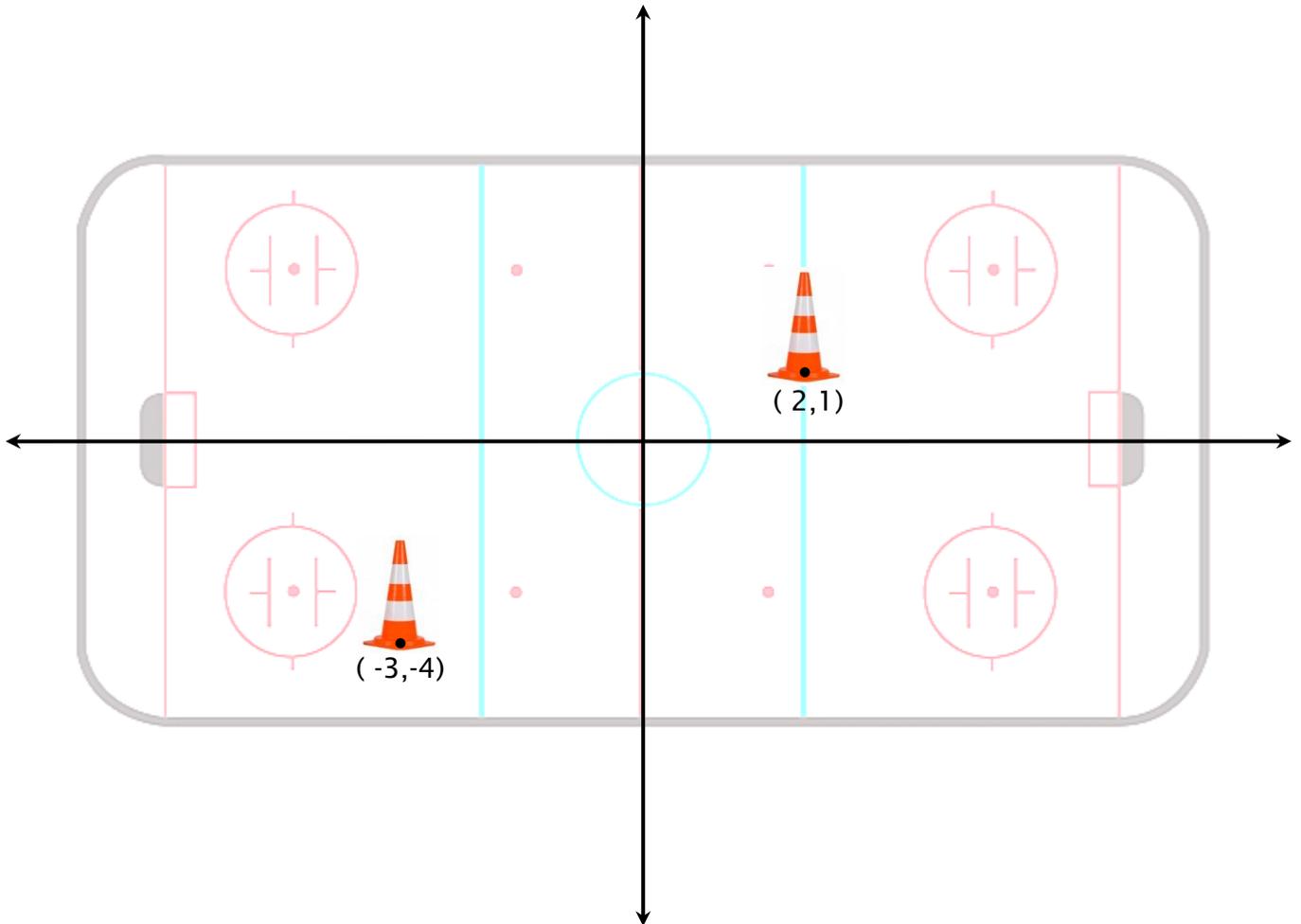
2. Solve the equation

3. If  $x = 946$ , calculate the new total of grand stand seats





1. Label the  $x$  and  $y$  axis on the Cartesian plane
2. Add a number scale on both the  $x$  and  $y$  axis



3. As a drill, hockey skaters are required to pass a puck from point  $(2,1)$  and receive the pass at point  $(-3,-4)$ . Write the linear equation between these two points.



# O'BRIEN GROUP ARENA

There are 40 lights above each rink. Each light omits 1,000 watts of energy.

1. How much energy does it take to run all of the lights for one hour?



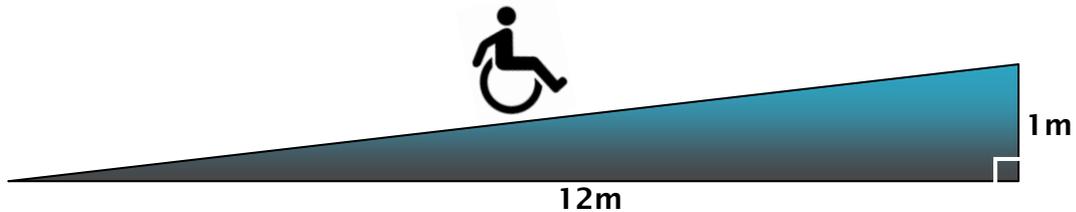
2. To run all the lights costs \$38.00 per hour. How much would it cost to run three quarters of the lights for 3 hours?

3. The cost for a concession to skate is \$24.00. Use your answer from question 2 to help find out how many concession skaters would need to come in in order to cover the cost of running the lights.  
Give your answer as a whole number rounded up to the next one



# O'BRIEN GROUP ARENA

To accommodate for disabled guests, the O'Brien Group Arena has built entrance ramps which allows easy access into the venue.  
To meet regulation, the ramp is required to rise one metre for every 12 metres travelled horizontally as shown on the diagram below (not to scale).



1. Use Pythagoras' Theorem to calculate the diagonal length of the ramp

2. If the ramp is required to rise to a level of two metres, calculate the new length of the ramp (hypotenuse).

*Hint: Use the legal requirement ratio to calculate the horizontal length*



# O'BRIEN GROUP ARENA

3. Use ratios (similar triangles) to determine the height of the ramp if the horizontal length is:

a. 5m

b. 16m

c. 24m



Measurement: Similar Triangles



# O'BRIEN GROUP ARENA

1. The length of the NHL rinks and O'Brien Group Arena rinks is 60m. The width of O'Brien Group Arena is 2.05m wider on each wing than NHL rinks, which is 25.9m wide. How many metres wide is the O'Brien Group Arena Rink?
2. There are two ice skating rinks at O'Brien Group Arena. If the rinks were rectangle, what would the total surface area of both of the O'Brien Group Arena rinks combined be? *Hint: both rinks are the same dimensions*
3. The thickness of ice held on a rink is 3cm. What is the volume of water required to fill this area of Ice?



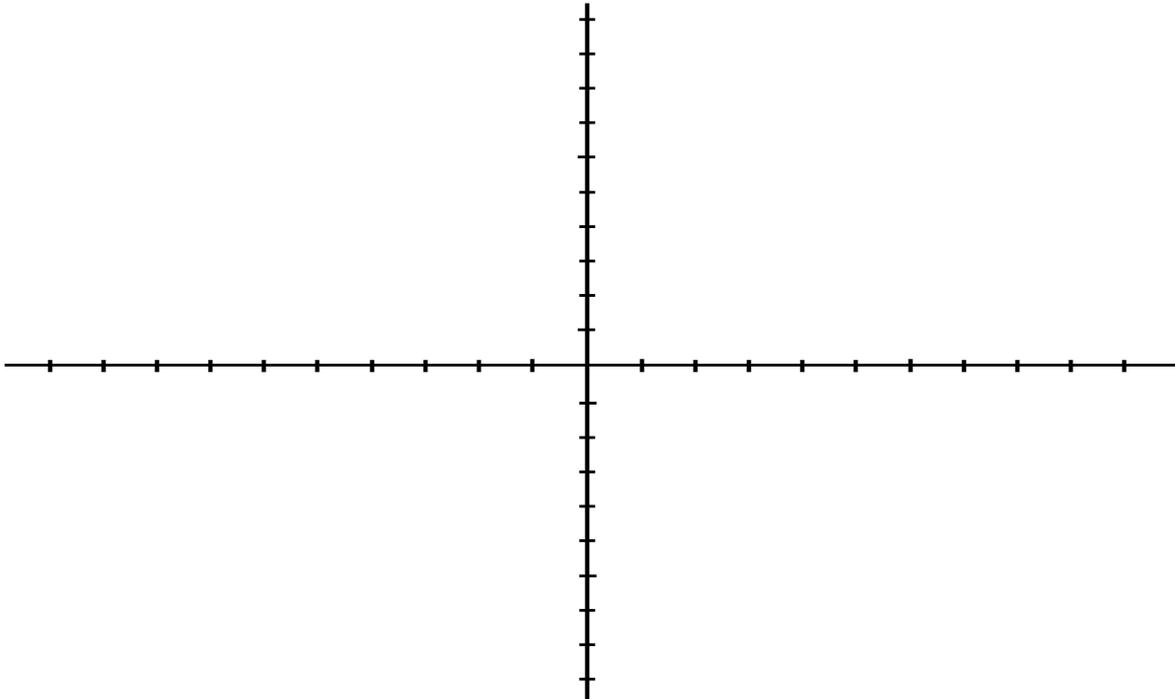


# O'BRIEN GROUP ARENA

During the weekdays the O'Brien Group Arena is open from 9am - 3pm. During this time the amount of skaters in the venue is tracked and then converted into an equation:

$$-10x^2 + 60x = 0$$

1. Simplify the equation
2. Solve for x
3. Find the turning point
4. Graph the equation, where x shows the number of hours after opening and y shows the amount of skaters.



5. At what *time* was it the busiest with skaters? \_\_\_\_\_