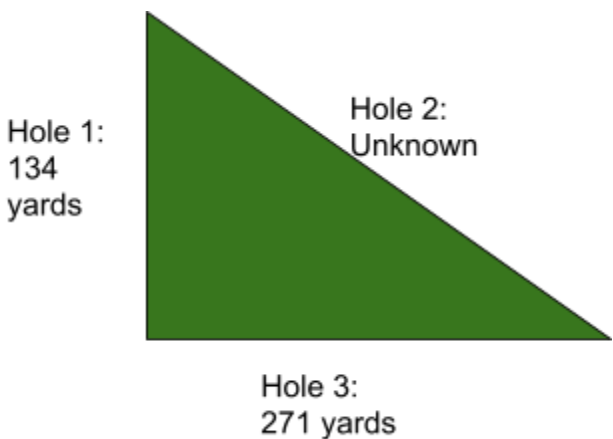


Module 1.0: Golf Measurements

1. The equation $A^2 + B^2 = C^2$ is a...
 - a. Triangle Equation
 - b. Polynomial Equation
 - c. Pythagorean Theorem
 - d. Transversal Theorem
2. What is the equation for finding the area of a circle?
 - a. $A = \pi 2r$
 - b. $A = \pi Cr^2$
 - c. $A = \pi C^2$
 - d. $A = \pi r^2$
3. If you are golfing and you know the length of two holes that make a right angle, you can calculate the hypotenuse. Using the diagram below, calculate the length of the third hole.



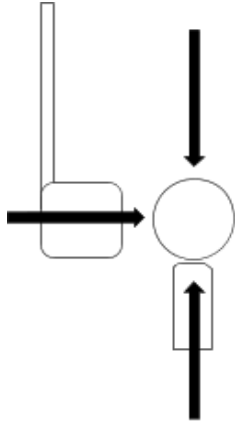
- a. 202 yards
 - b. 268 yards
 - c. 302 yards
 - d. 405 yards
 - e. 542 yards
4. Water hazards and sand traps are generally circular shapes. Find the area of the sand trap in the diagram below. ($r = 8$ ft $c = 50$ ft)



- a. 50 ft
- b. 201 sq ft
- c. 7850 sq ft
- d. 10,048 sq ft

Module 2.0: Force of a Golf Swing

1. Does the diagram below show a balanced or unbalanced force?



2. Does the diagram below show a balanced or unbalanced force?



3. Which of Newton's Laws can you use to calculate the force acting on a golf ball?
- a. Newton's 1st Law
 - b. Newton's 2nd Law
 - c. Newton's 3rd Law

Module 3.0: Scoring in Golf

1. Using the scorecard below, calculate the score for hole 6.

HOLE	1	2	3	4	5	6	7	8	9	OUT
PAR	9	8	3	6	7	11	5	10	8	
Person 1	4	5	5	3	4	8	5	8	5	

- 3
- 3
- 8
- 8

2. In order to calculate your score for the whole game, what information do you need?

(Hint: there are multiple answers)

- Par
- Handicap
- Strokes per hole
- Course rating

3. Which of the following is the best mathematical expression to calculate your score for the whole game?

- Total number of strokes = par
- Total number of strokes
- Par = total number of strokes
- The sum of each hole scored

Module 4.0: Engineering a Pushcart

1. Which of the following ways do engineers evaluate the 'best' solution?

(Hint: there are multiple answers)

- Trial and Error.
- Collect data from multiple solutions and compare it to the needs of the stakeholder.
- Use the criteria and constraints to evaluate ideas.
- Compare the strengths and weaknesses of each design.
- Test the solution.

2. Why is it important to establish clear criteria and constraints for the EDP (Engineering Design Process)?
 - a. Clear criteria makes it easier to come up with ideas to solve the problem.
 - b. Criteria and constraints help narrow the design to fix the problem.
 - c. Constraints help the engineer make more of a profit.
 - d. Criteria and constraints ensure a working prototype.

3. Engineers solve problems: What problem does a Pushcart solve?

4. Engineers solve problems: What problem does a golf bag solve?

Module 5.0: What is a Golf Ball?

1. What is the value of identifying criteria and constraints?

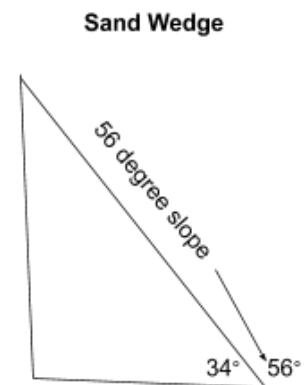
2. Which of the following is *not* a way golf ball technology changed over time?
 - a. The golf ball got smaller and lighter.
 - b. The golf ball changed shape.
 - c. The golf ball now has dimples.
 - d. The golf ball is made of various materials.

3. Which of the following is NOT a likely reason new golf ball technology would emerge in the game?
 - a. A new material is created that absorbs vibration.
 - b. A microchip that can track distance and speed is cheap enough to mass produce.
 - c. The rules of the game change.
 - d. The material and shape of the golf club change.

Module 6.0: Angles

1. As the angle of the club slope _____, the ball height will _____.
 - a. increases, decrease
 - b. decreases, increase
 - c. increases , increase
 - d. decreases, decrease

2. The 5 iron has a club face slope angle of 27 degrees. What is the complementary angle that would be needed to draw the club?
 - a. 63
 - b. 153
 - c. 333



3. T or F: Each golf club is designed for a different function.

Module 7.0: Kinetic Energy in Golf

1. Which statement correctly explains how changing the mass will impact kinetic energy?
 - a. If velocity is constant, increased mass will increase kinetic energy.
 - b. If velocity is constant, increased mass will decrease kinetic energy.
 - c. If velocity is constant, decreased mass will increase kinetic energy.
 - d. Mass does not affect kinetic energy.
2. What is the equation for kinetic energy?
 - a. $K=2mv^2$
 - b. $K=2vm^2$
 - c. $K=1/2vm^2$
 - d. $K=1/2mv^2$
3. Two players each hit a golf ball with a mass of .046 kg: Player One's drive has a velocity of 80 m/s and Player Two's drive has a velocity of 70 m/s. What is the difference in kinetic energy between the two drives?
 - a. Player One's drive has 0.23 more joules of kinetic energy.
 - b. Player One's drive has 34.5 more joules of kinetic energy.
 - c. Player One's drive has 138 more joules of kinetic energy.
 - d. Player One's drive has 486 more joules of kinetic energy.

Module 8.0: Areas of the Golf World

1. What are the four common air masses?
 - a. Maritime, Continental, Tropical, and Polar
 - b. Ocean, Land, Hot and Cold
 - c. Ocean, Land, Tropical, and Polar
 - d. Maritime, Continental, Hot and Cold
2. What happens when two air masses collide?
 - a. Weather
 - b. Fronts
 - c. Earthquake
 - d. Tornado
3. Describe the interaction when a cool, moist air mass collides with a warm air mass.
**Cold Front*