

GRADE 11

SUBJECT: MATHEMATICS

WEEK 9 LESSON 2

TOPIC: TRIGONOMETRY

OBJECTIVE: Solve practical problems involving heights and distances in three dimensional situations

SUB-TOPIC: ANGLES OF ELEVATION AND DEPRESSION

Content:

1. Brian's kite is flying above a field at the end of 65 m of string. If the angle of elevation to the kite measures 70° , how high is the kite above Brian's head?
2. From an airplane at an altitude of 1200 m, the angle of depression to a building on the ground measures 28° . Find the distance from the plane to the building.
3. From a point on the ground 12 ft from the base of a flagpole, the angle of elevation of the top of the pole measures 53° . How tall is the flagpole?
4. From a plane flying due east at 265 m above sea level, the angles of depression of two ships sailing due east measure 35° and 25° . How far apart are the ships?
5. A man flies a kite and lets out 100 feet of string. The angle of elevation of the string is 52° . How high off the ground is the kite? How far away is the man from the spot directly under the kite?
6. From the top of a vertical cliff 40 m high, the angle of depression of an object that is level with the base of the cliff is 34° . How far is the object from the base of the cliff?
7. An airplane takes off 200 yards in front of a 60 foot building. At what angle of elevation must the plane take off in order to avoid crashing into the building? Assume that the airplane flies in a straight line and the angle of elevation remains constant until the airplane flies over the building.
8. A 14 foot ladder is used to scale a 13 foot wall. At what angle of elevation must the ladder be situated in order to reach the top of the wall?

ANSWERS 1. $x = 61$ m

2. $x = 2256.9$ m

3. $x = 15.9$ ft

4. $x = 189.9$ m

5. Height of kite: 78 ft.; Ground distance from man to kite: 61.6 ft

6. $x = 59.3$ m

7. The plane must climb at an angle greater than 16.7°

8. $\theta = 68.2^\circ$