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Assignment # 9  
MATH 171

- ① WHAT IS THE ANGLE OF ELEVATION OF THE SUN WHEN A 6 ft PERSON CASTS A 10 ft. SHADOW?
- ② A 3.6m LADDER IS PLACED AGAINST A WALL SUCH THAT ITS FOOT IS 1.5m FROM THE WALL. WHAT ANGLE DOES THE LADDER MAKE WITH THE WALL?
- ③ A PILOT IN AN AIRPLANE AT AN ALTITUDE OF 4000ft OBSERVES THE ANGLE OF DEPRESSION TO AN AIRPORT TO BE  $12^\circ$ . HOW FAR IS THE PLANE FROM THE AIRPORT?
- ④ AN OBSERVER 5.2km FROM THE LAUNCH PAD OBSERVES A MISSILE'S VERTICAL ASCENT.
  - (a) HOW HIGH IS THE MISSILE WHEN THE OBSERVER'S ANGLE OF ELEVATION TO IT IS  $31.3^\circ$
  - (b) WHAT WILL THE ANGLE OF ELEVATION BE WHEN THE MISSILE REACHES A HEIGHT OF 30km.
- ⑤ FROM A 100m HIGH TOWER, THE ANGLE OF ELEVATION TO THE TOP OF A SECOND TOWER IS  $34.2^\circ$ , & THE ANGLE OF DEPRESSION TO ITS BASE IS  $41.3^\circ$ .
  - (a) HOW FAR APART ARE THE TWO TOWERS
  - (b) HOW TALL IS THE SECOND TOWER?

(6) A flagpole is on the top of a building 37.5m away. The angles of elevations of the top & the base of the flagpole from the point 37.5m away are  $70^\circ$  &  $67^\circ$  respectively. Find the length of the flagpole.

\* Please provide a sketch of the scenario for each word problem.

### EXERCISES FROM TEXTBOOK

8.2 p. 243

# 27-36

### ADDITIONAL TRIG EQUATIONS

(NOTE)  $\sin^2 x = (\sin x)^2$

Solve for  $x$ ,  $0 \leq x < 360^\circ$ .

(A)  $\sin^2 x - 2 \sin x = 1$

(B)  $6 \cos^2 x = 4 \cos x$

(C)  $5 \cos x - 6 = -\sec x$

(D)  $\tan x + 3 \cot x = 4$

(E)  $\csc^4 x - 7 \csc^2 x + 10 = 0$