Exercise 1: (1.5 ptos)

a) Find the parametric, continuous and general equations of the straight line that goes through the points $A(5,-1)$ and $B(-2,7)$

b) Write the equation of the straight line that's perpendicular to $r \equiv x + 5y - 7 = 0$ and goes through the point $P(2,-3)$

Exercise 2: (1 pto) Given the points $P(k+4,-2)$ and $Q(4,k)$ find the value of k so that $\left|\overrightarrow{PQ}\right| = \sqrt{34}$

Exercise 3: (1 pto) Given the vectors $\vec{u} = (7,2)$, $\vec{v} = (1,18)$ and $\vec{w} = (5,-3)$ write $\vec{v}$ as a linear combination of $\vec{u}$ and $\vec{w}$

Exercise 4: (1 pto) If $\cos\alpha = 0.45$ and $\dfrac{3\pi}{2} < \alpha < 2\pi$ find the other two principal trigonometric functions and the value of the angle α

Exercise 5: (1 pto) Find the three principal trigonometric functions of $\alpha = \dfrac{2\pi}{3}$ (no calculator allowed)

Exercise 6: (1.25 ptos) Before I leave İstanbul I've asked my friend Hakan to help me measure the height of the dome of the Hagia Sophia (yes, I am going incognito). Gonyometrem nerede? Ah burada. We are standing $80\ \text{m}$ apart and we see the top of the dome with angles of $50°$ and $59.05°$. What's its height?

$80\ m$
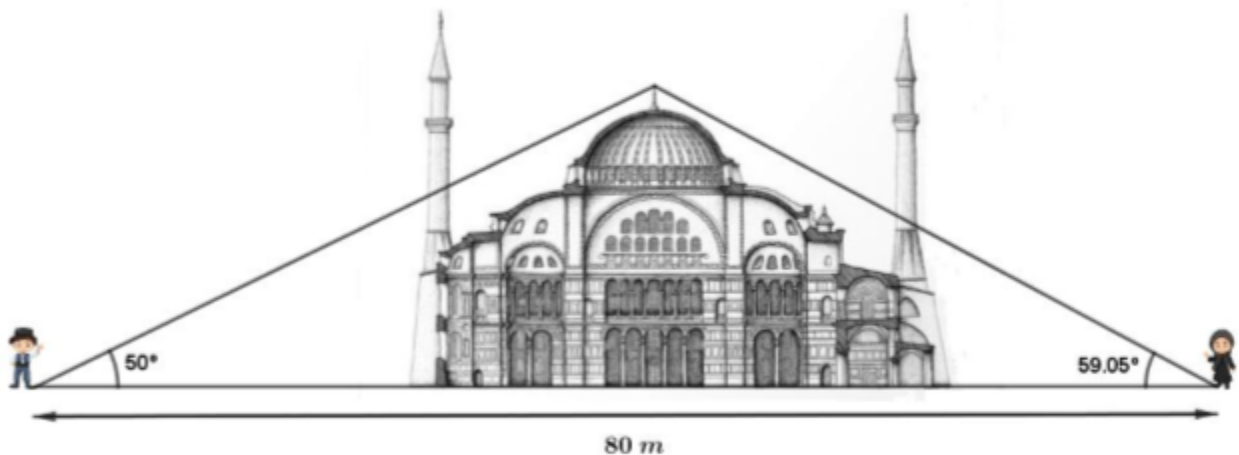
Exercise 7: (1.5 ptos) Given two events so that $P(\overline{A}) = 0.35$, $P(B) = 0.7$ and $P(A \cup B) = 0.9$, find:

a) $P(A \cap B)$

b) $P(B \,/\, A)$

c) Are A and B independent events? Are they mutually exclusive? Why?

Exercise 8: (1.75 ptos) A certain company stated that 80% of their employees got to work using some kind of vehicle, while the rest just walked. 12% of the people arriving by vehicle and 7% of the ones who didn't were late. Taking a random person working in that company find the probability that:
   a) They arrived late
   b) They walked to work, given that they got there in time