



TRIGONOMETRY AND ANALYTIC GEOMETRY TEST

4° ESO



Exercise 1: (1 pto) If $\tan \alpha = 1.75$, $\pi < \alpha < \frac{3\pi}{2}$ find the values of $\cos \alpha$, $\sin \alpha$ and the angle α

$$\cos \alpha = -0.5$$

$$\sin \alpha = -0.87$$

$$\alpha = 240.26^\circ$$

Exercise 2: (1.25 ptos) Find the three principal trigonometric functions of $\alpha = \frac{7\pi}{6}$ rad without using a calculator

$$\cos \frac{7\pi}{6} = -\frac{\sqrt{3}}{2}$$

$$\sin \frac{7\pi}{6} = -\frac{1}{2}$$

$$\tan \frac{7\pi}{6} = \frac{\sqrt{3}}{3}$$

Exercise 3: (1 pto) Convert:

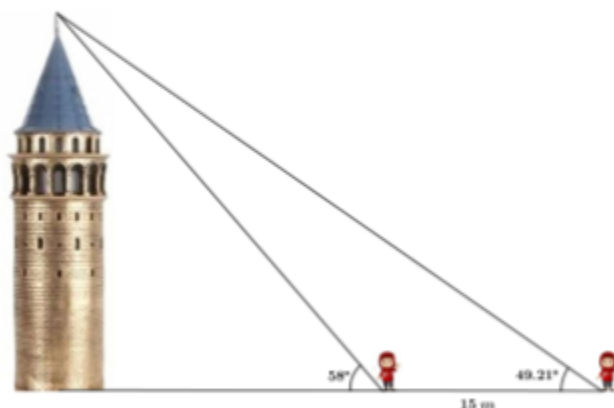
a) $\frac{11\pi}{15}$ rad into degrees $\rightarrow 132^\circ$

b) 165° into radians $\rightarrow \frac{11\pi}{12}$ rad

c) $\frac{17\pi}{12}$ rad into degrees $\rightarrow 255^\circ$

d) 315° into radians $\rightarrow \frac{7\pi}{4}$ rad

Exercise 4: (1.5 ptos) Istanbul, here I am. Buradayım. I'm going to use what I learnt in class to work out the height of the Galata Kulesi. I get my goniometer out of the pocket of my backpack and check the angle from my position to the top: 49.21° . Then I walk 15 m closer and check the angle again: 58° . Jeez, I've forgotten my calculator at home. Bana yardım et! What's its height?



$$h = 63.02 \text{ m} \approx 63 \text{ m}$$

Exercise 5: (1.25 ptos) Prove that the triangle given by the points $A(-1,8)$, $B(5,6)$ and $C(7,12)$ has a right angle. Where is it?

$$\overline{AB} \cdot \overline{BC} = 0 \rightarrow \text{The right angle is at the vertex B}$$



Exercise 6: (1.75 ptos) Given the points $A(3, k+1)$, $B(4, 7k)$ and $C(k+7, k+2)$ find the value of k so that the triangle that they form is isosceles in A

$$k = 1 \quad k = -3/7$$

Exercise 7: (1 pt) Given the vectors $\vec{u} = (-2, 22)$, $\vec{v} = (4, 8)$ and $\vec{w} = (3, -7)$ write \vec{u} as a linear combination of \vec{v} and \vec{w}

$$\vec{u} = \vec{v} - 2\vec{w}$$

Exercise 8: (1.25 ptos) Find the value of k so that the vectors $\vec{u} = (k-1, -7)$ and $\vec{v} = (k+1, k-1)$ are perpendicular

$$k = 1 \quad k = 6$$

