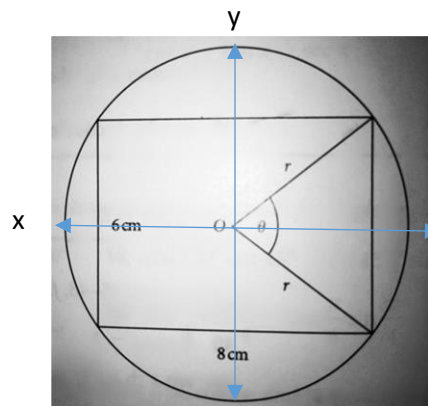


Learning Objectives for Ch 6

LO-4 Verify and apply trigonometric identities and solve trigonometric equations. 50pts	LO-5 Define, graph, use , and apply inverse trigonometric functions. 50pts	Total 100pts

1. (LO-4 20pts) In an electrical circuit, voltages are in the form of a sine or cosine wave. Two alternating current waves $V_1 = 10 \sin(50\pi t)$ and $V_2 = 10 \cos(50\pi t)$ interfere with each other to produce a third wave in the form of $V(t) = V_1(t) + V_2(t)$. Find the exact values of the positive number A and for θ in $[0, 2\pi]$ such that $V(t) = A \sin(50\pi t + \theta)$. [Hint: This is the formula: $A \sin x + B \cos x = C \sin(x + \theta)$.]

2. (LO-5 20pts) A rectangle 8 cm long and 6 cm wide, inscribed in a circle of radius r and center at point O , is shown to the right. Solve for the value of θ in degrees and be sure to show your steps. [Hint: the x-axis cuts the angle θ in half.]



3. (LO-4 15pts) The horizontal range, $R(\theta)$, of a projectile fired with an initial velocity of 60 meters per second at an angle θ is given by $R(\theta) = \frac{60^2 \sin \theta \cos \theta}{4.9}$, where $R(\theta)$ is in meters and $0^\circ < \theta < 90^\circ$. At what angle must the projectile be fired so that the horizontal range is 280 meters? [Hint: You'll use one of the double angle identities to solve this.]
4. For a parallelogram with height h , a base length of 10 inches, acute angle of θ , and a perimeter of 32 inches answer the following questions.

- a. (LO-4 15pts) Find the length of the other 3 sides and then write an expression for the area of the parallelogram in terms of the acute angle θ . [HINT: area of parallelogram is base*height]
- b. (LO-5 30pts) For what angle of θ does the parallelogram have an area of 48 sq.in.?

