

Review

December-02-13
7:30 AM

① If $\theta = \frac{7\pi}{6}$, $\alpha = \frac{-9\pi}{4}$, $\csc \beta = \frac{-5}{3}$, and $\cos \varphi = 0$

State only exact answers, if impossible – round to 2 decimals

- Draw separate pictures for each angle θ , α , β , φ and the triangles that relate to them, if possible.
- Solve for β and φ within the first positive revolution in radians
- Find all possible answers for $\cot \theta$, $\cos \alpha$, $\tan \beta$, and $\sin \varphi$
- Convert α to degrees, and show a check of your answer in c. using calculator in degree mode and in radian mode.

- ② A wind turbine has three blades, each measuring 3 m from centre to tip. At a particular time, the turbine is rotating four times a minute.
- Determine the angular velocity of the turbine in radians/second.
 - How far has the tip of a blade travelled after 5 min?

③ Sketch one cycle

Ⓐ $f(x) = 1 - \frac{1}{2} \sin\left(3x + \frac{\pi}{4}\right)$

Ⓑ $g(x) = 2 \sec \frac{x}{4}$

Ⓒ $h(x) = -\tan \pi x + 1$

- Ⓓ Give a point on the graph of $f(x)$ where the rate of change is zero, and an interval of x values where the graph $g(x)$ has negative rate of change.

4)

At one time, Maple Leaf Village (which no longer exists) had North America's largest Ferris wheel. The Ferris wheel had a diameter of 56 m, and one revolution took 2.5 min to complete. Riders could see Niagara Falls if they were higher than 50 m above the ground. Sketch three cycles of a graph that represents the height of a rider above the ground, as a function of time, if the rider gets on at a height of 0.5 m at $t = 0$ min. Then determine the time intervals when the rider could see Niagara Falls.