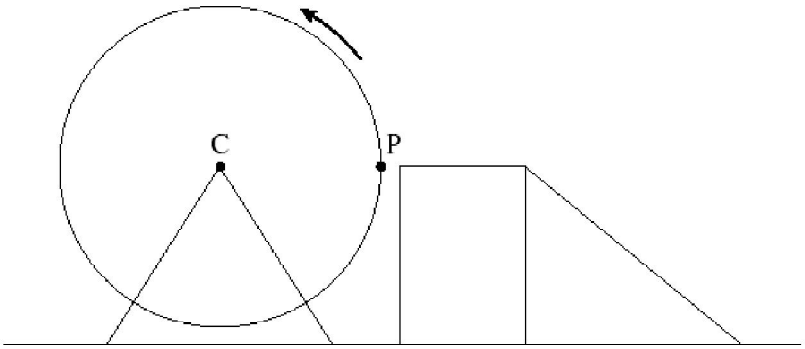
PreCalc12 Unit 5#2

1. A Ferris wheel has a radius of 18 metres and a centre C which is 20 m above the ground. It rotates once every 32 seconds in the direction shown in the diagram. A platform allows a passenger to get on the Ferris wheel at a point P which is 20 m above the ground. If the ride begins at point P, when the time $t = 0$ seconds, determine a sine function that gives the passenger's height, h, in metres, above the ground as a function of t.



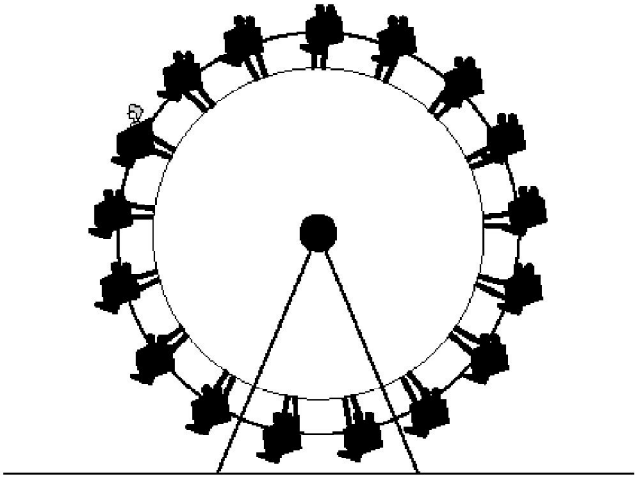
A. $h(t) = 18\sin\frac{\pi}{16}t + 20$

B. $h(t) = 18\sin\frac{\pi}{32}t + 20$

C. $h(t) = 20\sin\frac{\pi}{16}t + 18$

D. $h(t) = 20\sin\frac{\pi}{32}t + 18$

2. The Ferris wheel shown in the diagram has a radius of 16 m and its centre is 18 m above the ground. It rotates once every 60 s. Ethan gets on the Ferris wheel at its lowest point and then the wheel starts to rotate. How long does it take Ethan to reach 29 m above the ground for the first time?



A. 11.12 s
B. 22.24 s
C. 23.92 s
D. 37.76 s

3. A wheel of radius 30 cm has its centre 36 cm above the ground. It rotates once every 12 seconds. Determine an equation for the height, h, above the ground of a point on the wheel at time t seconds if this point has a minimum height at $t = 0$ seconds.

A. $h = -30\cos\frac{\pi}{12}t + 6$

B. $h = -30\cos\frac{\pi}{6}t + 6$

C. $h = -30\cos\frac{\pi}{12}t + 36$

D. $h = -30\cos\frac{\pi}{6}t + 36$

4. The function $h(t) = 3.9\sin 0.16\pi(t-3) + 6.5$ gives the depth of water, h metres, at any time, t hours, during a certain day. A cruise ship needs at least 8 metres of water to dock safely. Use the graph of the function to estimate the number of hours in the 24 hour interval starting at $t = 0$ during which the cruise ship can dock safely.

A. 3.79
B. 4.68
C. 7.57
D. 9.36

5. A wheel rolling along the ground has a radius of 32 cm and rotates once every 8 seconds. At time $t = 0$ seconds, a point P on the outside edge of the wheel is touching the ground. Determine a cosine function that gives the height, h, of point P above the ground at any time, t, where h is in cm and t is in seconds.

A. $h(t) = -32\cos\frac{\pi}{4}t$

B. $h(t) = -32\cos 2\pi t$

C. $h(t) = -32\cos\frac{\pi}{4}t + 32$

D. $h(t) = -32\cos 2\pi t + 32$

KEY

1. A
2. B
3. D
4. D
5. C