AP Rotational Motion Quiz

1. A carnival ride rotates through 4 radians of angular displacement. If the ride has a diameter of 4 meters, what is the path length that the passengers have moved in this time? 8 m
2. A merry-go-round rotates 10 complete revolutions. What path length has the passenger moved through if they are seated 2 meters from the ride’s center?

125.6 m

1. Through how many radians has a 40 cm radius wheel rotated through if it has traveled 10 meters? 25 rads
2. What is the angular velocity of a fan blade that rotates counterclockwise at 300 rpm? 31.4 rads/s
3. What is the angular displacement of the blade in #4 during the first 5 seconds? 157 rads
4. What is the angular displacement of a 0.70 m diameter wheel that rolls 3 m clockwise? 8.57 rads
5. Shaun White is observed to complete a 1080 (that’s 3 complete revolutions) in 2 seconds. What is his angular displacement? 18.84 rads
6. What is his angular velocity? 9.42 rads/s
7. Find the angular velocity of a wheel on a truck, which is moving at 20 m/s, if the tire diameter is 1 m. 20 rads/s
8. How long does it take this wheel to rotate once? 0.31 s