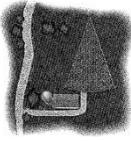


Lesson 4.1 APPLICATIONS (Round your answers to two decimal places)

1. a.) How many inches will the weight rise if the pulley is rotated through an angle of $71^{\circ}50'$ and $r = 9.27$ in
11.62 inches
b.) Through what angle, to the nearest minute, must the pulley be rotated to raise the weight 6 inches? **37.08°**
2. The picture shows a field in the shape of a sector of a circle. The central angle is 15° and the radius of the circle is 321 meters. Find the area of the field. **13488.04 m^2**

3. A pulley has a radius of 12.96 cm. Suppose it takes 18 sec for 56 cm of the belt to go around the pulley. Find the angular velocity of the pulley in radians per second. **.24 rad/sec**
4. Patrick is riding a racing bike at a speed of 50.4 kilometers per hour. The wheels have a diameter of 70 centimeters. Find the angular velocity of the wheels in radians per second. **40 rad/sec**
5. The crankshaft pulley of a car has a radius of 10.5 cm and turns at 6π rad/sec. What is the linear speed of the pulley? **63π or 197.92 cm/sec**
6. A tire with a 9-inch radius is rotating at 30 mph. Find the angular velocity of a point on its rim. Express the result in radians per minute. **3520 rad/min**
7. If a wheel with a 16-inch diameter is turning at 12 rev/sec, what is the linear speed of a point on its rim in ft/min? **960π or 3015.93 ft/min**
8. The wheel of a machine rotates at the rate of 300 rpm (rotations per minute). If the diameter of the wheel is 80 cm, what are the angular (in radians per second) and linear speed (in cm per second) of a point on the wheel?
 10π or 31.42 rad/sec; 400π or 1256.64 cm/sec
9. Dan Druff and Ella Funt are riding on a Ferris wheel. Dan observes that it takes 20 sec to make a complete revolution. Their seat is 25 ft from the axle of the wheel.
 - a. What is their angular velocity in radians per minute? **6π or 18.85 rad/min**
 - b. What is their linear velocity? **150π or 471.24 ft/min**
10. David puts a rock in his sling and starts whirling it around. He realizes that for the rock to reach Goliath, it must leave the sling at a speed of 60 ft/s. So, he swings the sling in a circular path of radius 4 ft. What must the angular velocity be for David to achieve his objective? **15 rad/sec**
11. Two pulleys have diameters of 30 cm and 16 cm. The larger pulley rotates 50 times in 72 seconds. Find the number of radians per second of the smaller pulley. Leave your answer in the form of π **$\frac{125\pi}{48}$ cm/sec**
12. A flywheel with radius 15 cm is spinning so that a point on the rim spins 120 cm/sec. Find the number of revolutions per minute the flywheel is spinning. **76.39 rev/min**
13. A gear is driven by a chain that travels 90 m per seconds. Find the radius of the gear if it makes 50 revolutions per minute. **17.19 meters**