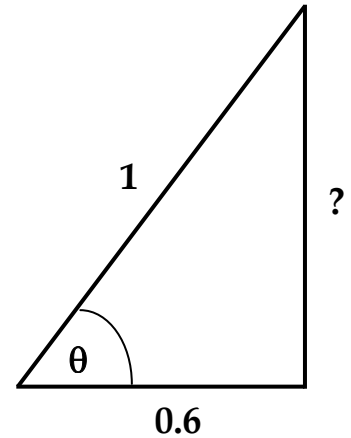


For each question (except multiple choice questions), your solution must show work/calculations and display/explain your reasoning.

1. The right triangle shown has an unknown side length and an unknown angle θ (labeled).

a) Determine the unknown side length.

b) Determine $\cos \theta$ and $\sin \theta$.



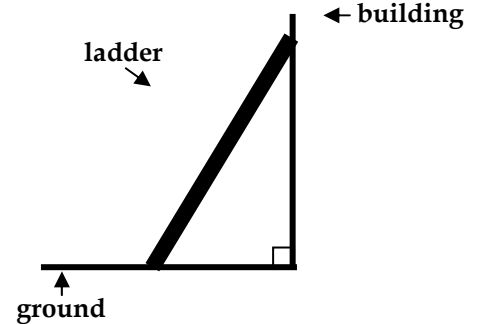
2. A 32 foot ladder leans against a building so that the angle between the ladder and the building is 15° .

a) What is 15° in radians? (circle one; all are in radians)

b) The figure (not to scale) shows the situation. Label all given distances and angles.

15	2π	360	$1/24$	24	5400
$2\pi/15$	$15/2\pi$	30π	$\pi/12$	$12/\pi$	$2700/\pi$

c) How far away is the base of the ladder from the building?



3. A velocipede travels at a constant angular speed around a circular track at a radius of 2.0 km. The velocipede completes 4 revolutions in 10 hours.

a) How long did it take to complete 3 revolutions? (circle one; all are in hours)

$4/10$	$10/4$	$10/12$	$12/10$	$4/30$	$30/4$	none of these
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b) How many revolutions did it complete in 3 hours? (circle one; all are in revolutions)

$4/10$	$10/4$	$10/12$	$12/10$	$4/30$	$30/4$	none of these
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c) continues on other side

3c) (continued from previous side) A velocipede travels at a constant angular speed around a circular track at a radius of 2.0 km. The velocipede completes 4 revolutions in 10 hours. Determine the velocipede's linear (tangential) speed.

4. Two forces **P** and **Q** act on an object of mass 10.0kg with **Q** being the larger of the two forces. When both forces are directed to the right, the magnitude of the acceleration of the object is 1.50m/s^2 . However, when the force **P** is directed to the right and the force **Q** is directed to the left, the object has an acceleration of 0.75 m/s^2 .

(a) What is the magnitude of P?

(b) What is the magnitude of Q?

5. You work at the farmer's market and you lift a crate of apples with a force of 144N, and it moves upward with an acceleration of 0.5 m/s^2 .

(a) What is the mass of the apple crate?

(b) How much does the apple crate weigh?