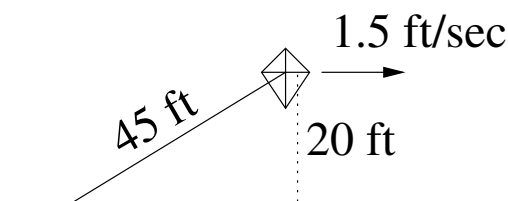


1. Angelina is putting air into a spherical balloon at a rate of  $500 \text{ cm}^3$  per second, and the radius of the balloon is 11 cm. How fast is the radius of the balloon increasing?

Do **NOT** try to solve the problem at first. Instead:

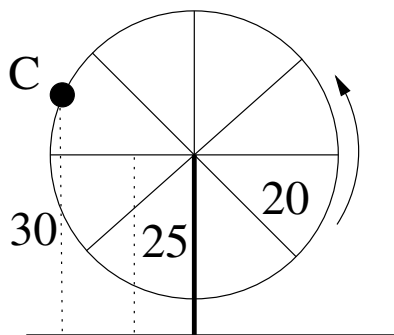
- (a) Give variable names to all of the quantities in the problem.
- (b) Write down an equation or equations relating the different quantities in the problem.
- (c) Translate the key parts of the question, word by word, into mathematical statements and questions.



2. Desi is flying a kite at a steady height of 20 feet above ground. The kite is moving away from him horizontally at a rate of 1.5 feet per second, and he currently has 45 feet of string spooled out between him and the kite. (See the picture above.) At what rate must Desi spool out more string to keep the kite 20 feet above ground?

Do **NOT** try to solve the problem at first. Instead:

- (a) Give variable names to all of the quantities in the problem.
- (b) Write down an equation or equations relating the different quantities in the problem.
- (c) Translate the key parts of the question, word by word, into mathematical statements and questions.



3. Clarence is riding a Ferris wheel whose radius is 20 feet and whose center is 25 feet above ground (see picture). The Ferris wheel is rotating at a rate that, if held constant, would result in a full rotation once every 57 seconds. If Clarence is 30 feet above ground, and headed downwards, as shown, find the rate at which his height is decreasing.

Do **NOT** try to solve the problem at first. Instead:

- (a) Give variable names to all of the quantities in the problem.
- (b) Write down an equation or equations relating the different quantities in the problem.
- (c) Translate the key parts of the question, word by word, into mathematical statements and questions.