

Warm Up: Pre-Calc

1/22

For two whole numbers m and n , if m is less than 20 and n is less than 10, then which of the following must be true?

- ~~a) $m + n$ is greater than ten~~
- ~~b) $m - n$ is greater than 10~~
- ~~c) $m - n$ is less than ten~~
- d) $m + n$ is less than 30
- e) m is greater than n

Feb 27-7:39 AM

W.A.L.T.:

Recognize situations that model periodic data.

W.A.S.I.:

We can use information in the context to sketch graphs of periodic data.

Mar 7-9:45 AM

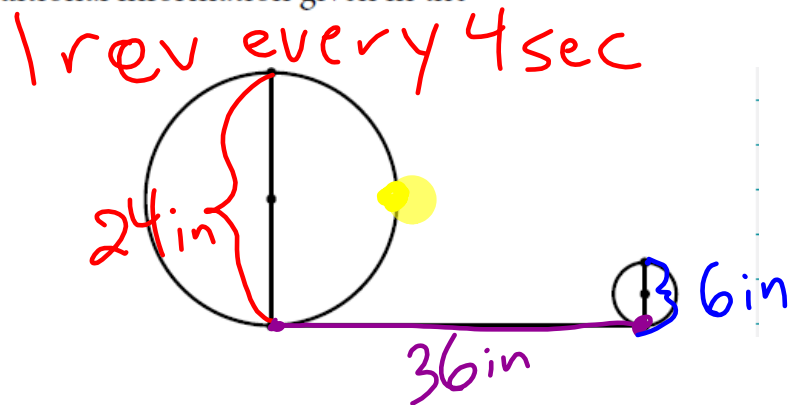
Stacy has a new bike. The bike has 24-inch-diameter wheels and 6-inch-diameter training wheels. The horizontal distance between the center of the 24-inch front wheel and the center of one 6-inch training wheel is 36 inches. Stacy is riding at a steady pace, and the 24-inch wheels rotate once every 4 seconds. As Stacy is riding down the street, her bike runs over a freshly painted parking stripe, and each wheel picks up a narrow strip of fresh paint that leaves marks on the pavement.



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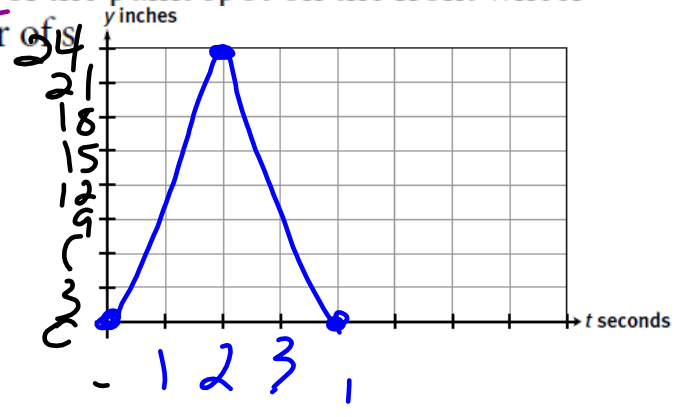
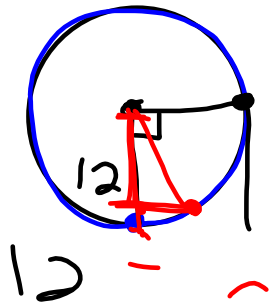
Jan 3-10:23 AM

1. **Model with mathematics.** The figure at the right represents the front wheel and a training wheel on Stacy's bike. Label the length of each of the three segments shown in the figure, and then summarize any additional information given in the opening paragraph.



Jan 3-10:23 AM

2. Let $t = 0$ seconds represent the time when Stacy's front wheel first crosses the freshly painted stripe. Sketch a graph of the height above the pavement of the paint spot on the front wheel as a function of the number of seconds after $t = 0$.



Jan 21-10:26 AM

3. Assume that Stacy's bicycle is on a path that runs perpendicular to the paint stripe.
 a. Find the distance that the front wheel travels in 4 seconds. Then use this information to find how long it takes for the training wheel to make one complete revolution.

Jan 3-10:23 AM

- b. How many seconds will it take from $t = 0$ seconds until the training wheel first runs over the freshly painted stripe?

36 in —

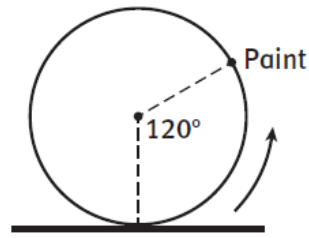
- c. On the grid in Item 2, sketch a graph of the height of the paint spot on the training wheel as a function of the number of seconds elapsed since $t = 0$.

Jan 3-10:24 AM

4. Use the sketch from Item 3c to **estimate** the first time that the paint spots on the front wheel and on the training wheel will be exactly the same height above the pavement.

Jan 3-10:24 AM

5. A more accurate graph would give a better approximation of the time you found in Item 4.
- a. How many seconds after hitting the wet stripe will the paint spot first be in this position on the front wheel?



- b. **Make use of structure.** Explain how special right triangles can be used to find the height of the paint spot.

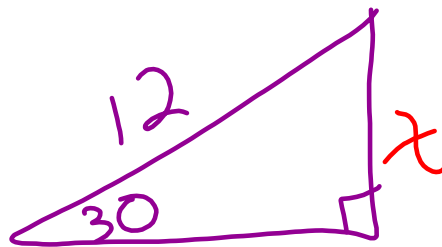
Jan 3-10:30 AM

- c. Find the height of the paint spot to the nearest tenth of an inch.

18 in

- d. Is there any other instance during the first revolution of the wheel where the paint spot is at this same height? How long after hitting the stripe does this happen?

TaH
 $\tan 30 = \frac{x}{12}$



Jan 3-10:30 AM

Today's Activities:

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P.W. for tonight:

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Day 2

Feb 27-7:23 AM