PreCalculus
Quiz

Your Name:

1. In the confused days before the invention of the circular wheel, Fritz rides a bicycle with one triangular wheel and one rectangular wheel. The triangular wheel is a 3-4-5 right triangle with an area of 600 square inches. The rectangular wheel is twice as tall as it is wide and has an area that is one-and-a-third times that of the triangular wheel.

a. Draw a picture of this bicycle.

b. What are the lengths of the sides of the triangular wheel?

c. What are the height and width of the rectangular wheel?

Fritz starts pedaling with both wheels' largest sides facing the ground.

d. Draw a picture of how the bicycle looks as Fritz starts pedaling.

e. How far does he travel before the wheels rotate such that their largest sides once again face the ground?

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2. The track of a roller coaster is described by the polynomial function $f(x) = -\frac{1}{100}x^4 + \frac{1}{2}x^2 - x + 5$. At what (x,y) location(s) is a rider's position perfectly level (not tilted forward or back)? Use your calculator to approximate your answer(s) to three decimal places.

3. Find the quotient and remainder using long division.

$$\frac{2x^3 - 3x^2 + 7x - 1}{x^2 + 2}$$

4. Use synthetic division to determine whether or not c is a zero of the function.

$$f(x) = -x^3 + 6x^2 - 3x - 10$$
$$c = 5$$