

You have 20 minutes to take this quiz. Each problem will be graded for clarity of work as well as correctness, so show all work **clearly and in order**. Circle or otherwise indicate your final answers. Please note that there are problems on both the front and the back of this page.

1. (7 points) [Similar to #48, 1.7]

Suppose that f and g are odd functions. What can you conclude about $f \cdot g$? Justify your answer.

2. (7 points) [Similar to #4, 1.8]

Prove that the following statement is true for all positive integers:

$$1 + 3 + 5 + \dots + (2n - 1) = n^2.$$

3. (6 points) [Similar to reading, 1.6]

Complete each of the definitions below. In parts (a) and (b) use the first blank to give the general form of the function, and the second blank to list any conditions on the letters and terms from the first blank.

(a) $f(x)$ is a *polynomial function* if:

$$f(x) = \underline{\hspace{2cm}}, \text{ where } \underline{\hspace{2cm}}.$$

(b) $f(x)$ is a *rational function* if:

$$f(x) = \underline{\hspace{2cm}}, \text{ where } \underline{\hspace{2cm}}.$$

(c) Suppose t is an angle whose terminal edge intersects the unit circle at the point $P(x, y)$ as in the diagram below. Define $\csc(t)$ in terms of x and y .

$$\csc(t) = \underline{\hspace{2cm}}.$$

