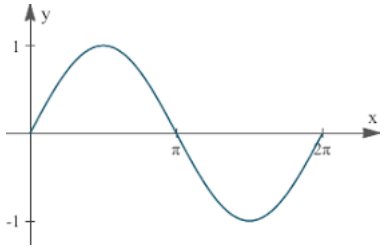
Section 1.3: Precalculus Review, part 2 (PREP WORK)

1. What is a function?

2. TRUE OR FALSE? If $f(x) = \dfrac{x^2 - 4}{x - 2}$ and $g(x) = x + 2$, then $f(x) = g(x)$. Explain your answer.

3. TRUE OR FALSE? The inverse of $f(x) = x^2$ is $f^{-1}(x) = \sqrt{x}$? Explain your answer.

4. TRUE OR FALSE? This is NOT the graph of $f(x) = \sin(x)$ (Explain your answer):



Section 1.3: Precalculus Review, part 2

Section 1.3.1 Functions

1. What is a function?

2. TRUE OR FALSE? If $f(x) = \dfrac{x^2 - 4}{x - 2}$ and $g(x) = x + 2$, then $f(x) = g(x)$. Explain your answer.

Section 1.3.5 Exponential Functions: Applications

Population Models

A bacteria experiment shows an initial population of 90 bacteria. Four hours later, the number of bacteria has doubled. What will the bacteria population be 30 hours from now?

Radioactive Decay

Aggigium is a radioactive substance with a half-life of 2023 days. If 10,000 grams of the substance are present, how much remains after 8,092 days? After t days?

Section 1.3.6 Inverse Functions

Definitions:

A function is **one to one** if and only if

The **inverse** of a one to one function $f : A \to B$ (domain A, range B) is a function g such that:

1. g :

2. $g(x) = y$ if and only if

Examples

Show $f(x) = \dfrac{2-x}{2+x}$ is one-to-one and find f^{-1}.

TRUE OR FALSE? The inverse of $f(x) = x^2$ is $f^{-1}(x) = \sqrt{x}$? Explain your answer.

Section 1.3.7 Logarithmic Functions

Recall: $y = \log_a x$ if and only if

and $y = \ln(x)$ if and only if

Change of Base Formula: $\log_a(x) =$

Examples:

A bacteria experiment shows an initial population of 90 bacteria. Four hours later, the number of bacteria has doubled. When will 1,000 bacteria be present?

Section 1.3.8 Trigonometric Functions

Graphs of basic trig functions:

$f(x) = \sin(x)$ $f(x) = \cos(x)$ $f(x) = \tan(x)$.

Scaling of basic trig functions: $f(x) = A\sin(kx)$