

Pre-requisites for AP Calculus

Interval on the Real number line

- Bounded Open Interval $\{x: a < x < b\}$
- Bounded Closed Interval $\{x: a \leq x \leq b\}$
- Unbounded Open Interval $\{x: x < b\}$
 $\{x: x > a\}$
- Entire Real Line $\{x: x \in \mathbb{R}\}$

Solving Inequalities

a) Solve $|x + 3| > 5$

b) Quadratic Solve $x^2 < -2x + 8$

Coordinate Geometry

- Distance Formula $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$
- Midpoint Formula $\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$
- Standard Form of a Circle $(x - h)^2 + (y - k)^2 = r^2$
- Standard Form of a Parabola $y = a(x - p)^2 + q$

Rewrite $y = 2x^2 - 12x + 7$ in standard form

Symmetry

y-axis symmetry

x-axis symmetry

origin symmetry

Determine if the function is even or odd.

$$f(x) = x^3 - x$$

$$f(x) = x^2 + 1$$

Intercepts

Find the x and y intercepts of $y = x^3 - 4x$

Slope

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

Positive Slope

Zero Slope

Negative Slope

No Slope or
Undefined Slope

Equations of Lines

- General Form
- Vertical
- Horizontal
- Point Slope
- Slope Intercept

Parallel Lines:

Perpendicular Lines:

Domain and Range

Domain: Set of all x-values

Range : Set of all y-values

Find the domain of $f(x) = \sqrt{x^2 - x - 6}$

Transformations

Vertical shift		Horizontal shift	
• $y = f(x) - c$		• $y = f(x - c)$	
• $y = f(x) + c$		• $y = f(x + c)$	
Reflections		Stretches	
• $y = -f(x)$		• $y = af(x)$	
• $y = f(-x)$		• $y = f(bx)$	

Composition of Functions

$$(f \circ g)(x) = f(g(x))$$

Find $(f \circ g)(x)$ if $f(x) = 2x + 3$ and $g(x) = x^2 + 1$

Trigonometry

Angles in Standard Position: Measured from the positive x-axis in a counterclockwise direction.

Coterminal Angles: Angles that have the same terminal arm.

Radian Measure: $180^\circ = \pi \text{ radians}$

Convert 40° into radians.

Convert $\frac{\pi}{2}$ into degrees

Trig Functions:

$$\sin \theta =$$

$$\csc \theta =$$

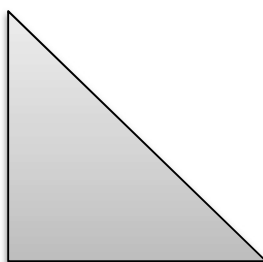
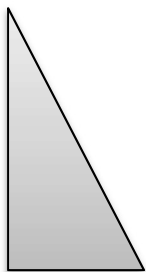
$$\cos \theta =$$

$$\sec \theta =$$

$$\tan \theta =$$

$$\cot \theta =$$

Exact Values and Special Triangles:

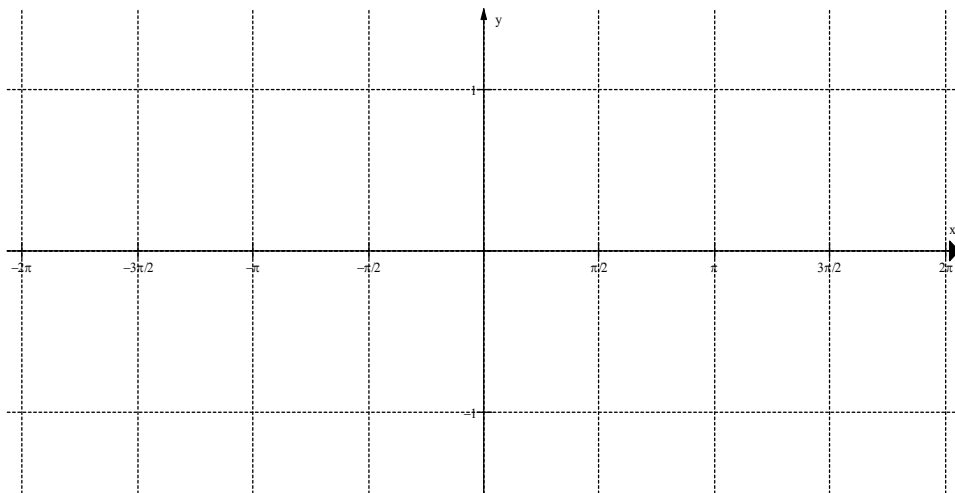


Trig Equations:

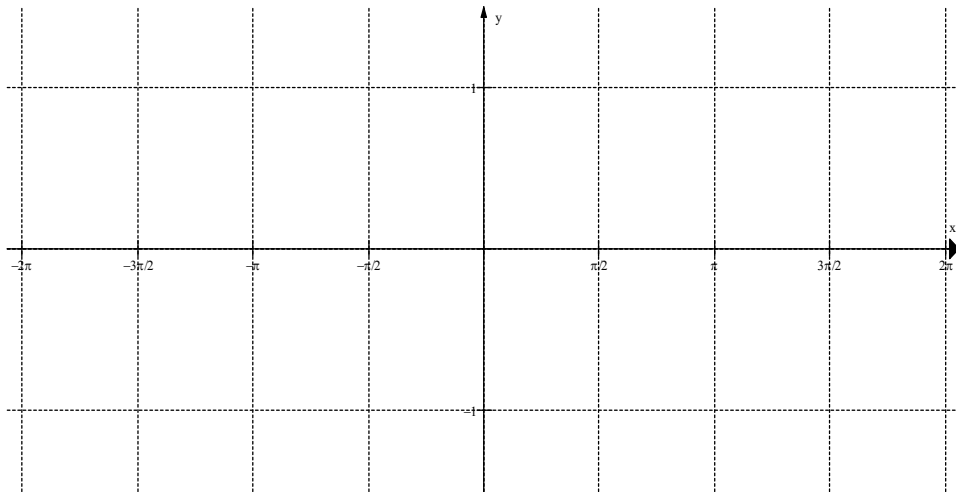
Solve $\cos 2\theta = 2 - 3 \sin \theta$ where $0 \leq \theta < 2\pi$

Graphs of Trig Functions:

$y = \sin x$ and $y = \csc x$



$y = \cos x$ and $\sec x$



$y = \tan x$ and $y = \cot x$

