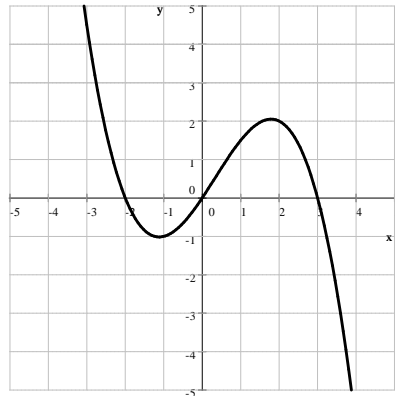


This quiz is optional and it is due on Monday, March 31 at the beginning of class. For full credit, show all work, using correct notation. Unless otherwise indicated, present the exact value of all answers.

- (2 points) Compute an approximate value for all angles in the triangle with sides 8 cm, 8 cm, and 11 cm.
- (2 points each) Simplify each of the following.
  - $3^{\log_9 A}$
  - $\log_{\sqrt{27}} \frac{1}{3}$
  - $\log_2 \left( \sec \frac{\pi}{4} \right)^5$
  - $e^{3 \ln 2} - e^{-\ln 7}$
- (4 points each) Simplify each of the following. Rationalize all denominators.
  - $\tan 15^\circ$
  - $3 \log_2 (2x^2) - \log_2 (6x^4) + \log_2 \left( \frac{3}{x^2} \right)$
  - $\sin 37^\circ \sin 7^\circ + \cos 37^\circ \cos 7^\circ$
- (3 points) Find the domain of  $f(x) = \ln(4 - x^2) + \frac{1}{x^3}$
- (3 points) Let  $\alpha$  and  $\beta$  be acute angles such that  $\sin \alpha = \frac{2}{\sqrt{13}}$  and  $\cos \beta = \frac{1}{\sqrt{5}}$ . Compute the exact value of  $\tan(2\alpha - \beta)$ .
- (3 points) Solve  $\frac{3x - 5}{2x + 1} \leq 2$ .
- (3 points each) Solve each of the following equations. Present exact values of all solutions. In case of trigonometric equations, present solutions in radians.
  - $\tan 5x = -\frac{1}{\sqrt{3}}$
  - $\sqrt{3x + 1} + \sqrt{x - 1} = 2$
  - $3 \cdot 5^{2x-1} = 6 \cdot 2^{x-2}$
- (3 points) Graph  $y = \frac{1}{f(x)}$  given the graph of  $y = f(x)$ .



- (2 points each) Graph each of the following.
  - $y = \csc x$
  - $y = -2(x + 3)^2 x(x - 1)$
- (5 points each) Prove the following identity.
 
$$\sin^2 2x - (\sin x)(\sin 3x) = \sin^2 x$$
- (3 points) Find an equation for all tangent lines drawn to  $y = -\frac{1}{2}x^2 + 5x - 1$  from the point (1, 8).