

No Calculators Allowed

1. Let $f(x) = 3\sec(x) - 2$ and $g(x) = 4$. In the xy -plane, what are the x -coordinates of the points of intersection of the graphs of f and g for $0 \leq x < 2\pi$?

$$3\sec(x) - 2 = 4 \quad 3\sec(x) = 6 \quad \sec(x) = 2 \quad \frac{1}{\cos(x)} = 2 \quad \cos(x) = \frac{1}{2} \quad x = \frac{\pi}{3}, \frac{5\pi}{3}$$

2. Let $h(x) = 5 - 2\csc x$ and $k(x) = 7$. In the xy -plane, what are the x -coordinates of the points of intersection of the graphs of h and k for $0 \leq x < 2\pi$?

$$5 - 2\csc x = 7 \quad -2\csc x = 2 \quad \csc x = -1 \quad \frac{1}{\sin x} = -1 \quad \sin x = -1 \quad x = \frac{3\pi}{2}$$

3. Let $m(x) = 2 + \sqrt{3}\cot x$ and $p(x) = 1$. In the xy -plane, what are the x -coordinates of the points of intersection of the graphs of m and p for $0 \leq x < 2\pi$?

$$2 + \sqrt{3}\cot x = 1 \quad \sqrt{3}\cot x = -1 \quad \cot x = -\frac{1}{\sqrt{3}} \quad \tan x = -\sqrt{3} \quad x = \frac{2\pi}{3}, \frac{5\pi}{3}$$

4. Let $f(x) = 3\csc^2(x) - 1$ and $g(x) = 3$. In the xy -plane, what are the x -coordinates of the points of intersection of the graphs of f and g for $0 \leq x < 2\pi$?

$$3\csc^2(x) - 1 = 3 \quad 3\csc^2(x) = 4 \quad \csc^2(x) = \frac{4}{3} \quad \csc x = \pm \frac{2}{\sqrt{3}} \quad \frac{1}{\sin x} = \pm \frac{2}{\sqrt{3}} \\ \sin x = \pm \frac{\sqrt{3}}{2} \quad x = \frac{\pi}{3}, \frac{2\pi}{3}, \frac{4\pi}{3}, \frac{5\pi}{3}$$

5. Let $h(x) = 5 + \sqrt{3}\sec x$ and $k(x) = 3$. In the xy -plane, what are the x -coordinates of the points of intersection of the graphs of h and k for $0 \leq x < 2\pi$?

$$5 + \sqrt{3}\sec x = 3 \quad \sqrt{3}\sec x = -2 \quad \sec x = -\frac{2}{\sqrt{3}} \quad \frac{1}{\cos x} = -\frac{2}{\sqrt{3}} \quad \cos x = -\frac{\sqrt{3}}{2} \quad x = \frac{5\pi}{6}, \frac{7\pi}{6}$$

6. Let $m(x) = 3 + 5\sec^2 x$ and $p(x) = 13$. In the xy -plane, what are the x -coordinates of the points of intersection of the graphs of m and p for $0 \leq x < 2\pi$?

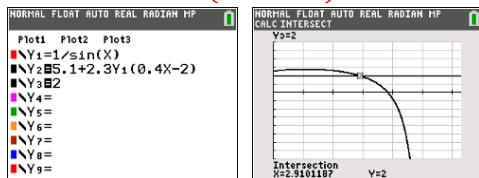
$$3 + 5\sec^2 x = 13 \quad 5\sec^2 x = 10 \quad \sec^2 x = 2 \quad \sec x = \pm\sqrt{2} \quad \frac{1}{\cos x} = \pm\sqrt{2} \\ \cos x = \pm \frac{1}{\sqrt{2}} \quad x = \frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4}$$

Calculators Required



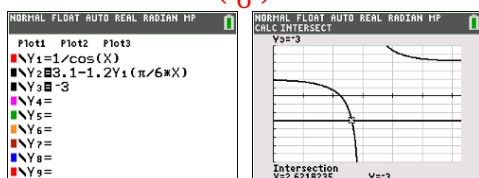
7. Let $f(x) = 5.1 + 2.3 \csc(0.4x - 2)$. In the xy -plane, what are the x -coordinates of the points of where $f(x) = 2$ for $0 \leq x < 2\pi$?

$$5.1 + 2.3 \csc(0.4x - 2) = 2 \quad x = 2.9101 \dots$$



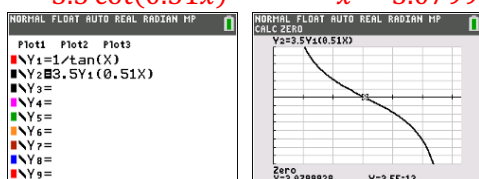
8. Let $f(x) = 3.1 - 1.2 \sec\left(\frac{\pi x}{6}\right)$. In the xy -plane, what are the x -coordinates of the points of where $f(x) = -3$ for $0 \leq x < 2\pi$?

$$3.1 - 1.2 \sec\left(\frac{\pi x}{6}\right) = -3 \quad x = 2.6218 \dots$$



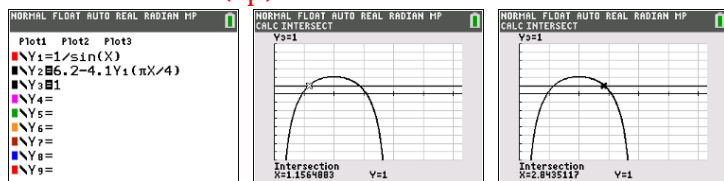
9. Let $f(x) = 3.5 \cot(0.51x)$. In the xy -plane, what are the x -coordinates of the zeros of $f(x)$ for $0 \leq x < 2\pi$?

$$3.5 \cot(0.51x) \quad x = 3.0799 \dots$$



10. Let $f(x) = 6.2 - 4.1 \csc\left(\frac{\pi x}{4}\right)$. In the xy -plane, what are the x -coordinates of the points of where $f(x) = 1$ for $0 \leq x < \pi$?

$$6.2 - 4.1 \csc\left(\frac{\pi x}{4}\right) = 1 \quad x = 1.1564 \dots, 2.8435 \dots$$



11. Let $f(x) = 2.1 + 2.7 \sec(3 - 0.4x)$. In the xy -plane, what are the x -coordinates of the points of where $f(x) = -5$ for $0 \leq x < 2\pi$?

$$2.1 + 2.7 \sec(3 - 0.4x) = -5 \quad x = 2.5977 \dots$$

