Calculus Readiness Self-Assessment - Solutions

Instructions: Score your work to see which problems you missed.

- If you missed very few questions and have confidence in the reasoning required to complete these problems then you are probably well suited to proceed to Math 1910.
- Students who miss more than a few questions (more than 3 questions/parts) should consider if their precalculus knowledge required for Math 1910 is sufficient. They might want to enroll in the two semester sequence for Calculus 1 (Math 1904 in Fall 2023 and Math 1906 in Spring 2024) instead of Math 1910. Alternatively, they may want to spend time prior to the start of the Fall 2023 semester reviewing precalculus materials.
- Students who missed more than 8 questions (or parts) should seriously consider whether their math background is sufficient to enroll in Math 1910.

Recall that this Calculus Readiness Tool is merely a self-assessment to use as you consider whether to take Math 1904 (and Math 1906) rather than Math 1910. As such, it is limited in its use and is not predictive in nature. A high score on this assessment does not guarantee all background material needed for Math 1910 is mastered.

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1. $f(a+2) = \frac{a^2+4a-1}{a+7}$
2. $y = 4x + 21$
3. $-2 < x < 1$
4. (a) $x = \frac{98}{5}$
   (b) $x \geq 1$ or $x \leq \frac{1}{3}$
5. (a) $f^{-1}(x) = \frac{2x}{1-x}$
   (b) The function g is not invertible since it is not one-to-one.
6. (a) x^3y^3
   (b) $2x^{11/10}y^{5/2}$
7. $x = \frac{7\pi}{6}, \frac{11\pi}{6}, \sin^{-1}\left(\frac{1}{3}\right), \pi - \sin^{-1}\left(\frac{1}{3}\right)$
8. $\frac{-5}{(x+1)(x+h+1)}$
9. (a) $(f \circ g)(x) = cos^2x + 3cosx + 7$
   (b) $h(x) = e^{x+7}$
10. $x = \frac{\pi}{4} + k\pi$, for any integer k
11. $x = \ln \frac{1+\sqrt{5}}{2}$
12. (a) Domain: $x > 0$, Range: All real numbers

(b) $f^{-1}(x) = 10^x$

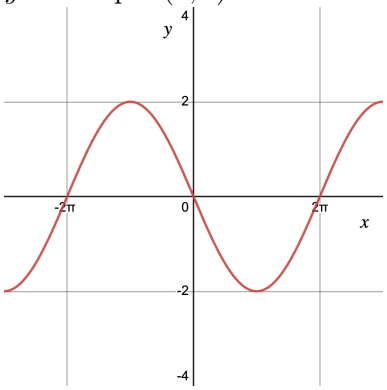
(c) $\frac{1}{2}$

13. (a) Domain: $x \neq -2$

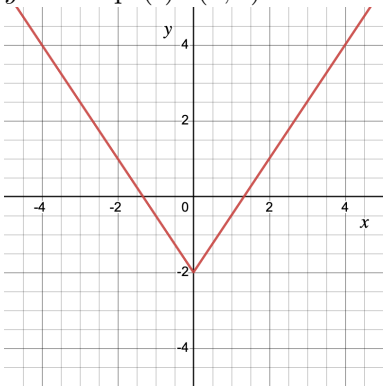
(b) $x = \frac{2}{3}, x = -\frac{2}{3}, x = -\frac{1}{2}$

(c) VA $x = -2$, HA $y = 18$

14. (a) Domain: $[-2, 2]$, Range: All real numbers
x-intercept(s): $... -4\pi, -2\pi, 0, 2\pi, 4\pi...$
y-intercept: $(0, 0)$



(b) Domain: All real numbers, Range: $y \geq -2$
x-intercept(s): $(-\frac{4}{3}, 0), (\frac{4}{3}, 0)$
y-intercept(s): $(0, 2)$



15. $\cos x = \frac{\sqrt{5}}{5}$; $\sin x = \frac{2\sqrt{5}}{5}$; $\sec x = \sqrt{5}$; $\csc x = \frac{\sqrt{5}}{2}$; $\cot x = \frac{1}{2}$

16. -5

17. $x = 1$