

Answers to Preliminary Review Problems - Calculus 1

Question 1:

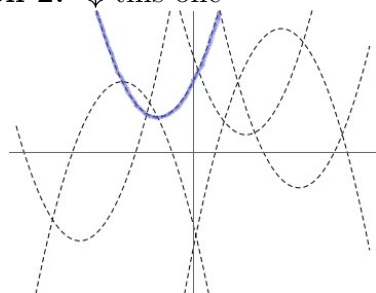
(a) $x = -2, -3$

(b) $(-\infty, -3) \cup (-2, \infty)$

(c) $x = -\frac{5}{2} + \frac{\sqrt{29}}{2}, -\frac{5}{2} - \frac{\sqrt{29}}{2}$

(d) $(-\frac{5}{2} - \frac{\sqrt{29}}{2}, -\frac{5}{2} + \frac{\sqrt{29}}{2})$

Question 2: ↓ this one



Question 3:

(a) $(-\infty, \infty)$

(b) $[-\sqrt{3}, \sqrt{3}]$

(c) $(-\infty, -4) \cup (-4, \infty)$

(d) $(-4, 3]$.

Question 4:

(a) $D_f = (-\infty, \infty)$

$R_f = (0, \infty)$

(b) $D_f = (4, \infty)$

$R_f = (-\infty, \infty)$

(c) $D_f = (-\infty, \infty)$

$R_f = [-5, 5]$

Question 5:

$$f \circ g(x) = \sin\left(\frac{1}{x+2}\right)$$

$$D_{f \circ g} = (-\infty, -2) \cup (-2, \infty)$$

$$g \circ f(x) = \frac{1}{\sin(x) + 2}$$

$$D_{g \circ f} = (-\infty, \infty)$$

Question 6: $\cos \theta = \sqrt{\frac{7-x^2}{7}}$, $\csc \theta = \frac{\sqrt{7}}{x}$, $\tan \theta = \frac{x}{\sqrt{7-x^2}}$

Question 7: $x = 2$, $y = 2\sqrt{2}$

Question 8: (a) 1 (b) $8 \sin \theta$

Question 9: $\theta = \frac{\pi}{3}, \frac{2\pi}{3}$

Question 10:

(a) $\tan(2\pi) = 0$ (b) $\sin\left(\frac{3\pi}{4}\right) = \sqrt{2}/2$ (c) $\csc\left(\frac{\pi}{3}\right) = 2/\sqrt{3}$
(d) $\arctan(-1) = -\pi/4$ (e) $\cos^{-1}(-1) = \pi$ (f) $\sec^{-1}(2) = \pi/3$

Question 11: (a) 125 (b) $x^{2/5}$

Question 12: (a) -5 (b) $1/2$

Question 13: (a) $\ln(108)$ (b) $\ln(3)$ (c) $\ln(\cos x)$

Question 14: (a) $x = \frac{\ln(3) + 2}{5}$ (b) $x = 1/3$

Question 15:

(a) $f(x) = \sqrt{x+1}$ $g(x) = e^x$
(a, Alt) $f(x) = \sqrt{x}$ $g(x) = e^x + 1$
(b) $f(x) = \tan x$ $g(x) = x^3$