

Review Sheet for Test #2

Compute the difference quotient $\frac{f(x+h)-f(x)}{h}$ for the functions.

1) $f(x) = x^2 - 3x + 7$

2) $f(x) = x^2 + 2x - 10$

Find the **exact** values of the roots of the function.

3) $f(x) = 2x^3 - 4x^2 - 33x + 15$

4) $f(x) = x^3 + 11x^2 + 32x + 16$

Solve the equation and round to the nearest thousandth.

5) $7\log_4(x) = 12$

6) $10e^{19-7x} = 85$

Solve the inequality and express your answer in interval notation.

7) $\frac{x+5}{x-3} \geq 0$

8) $\frac{2x+10}{x-7} < 0$

9) $|4x - 3| > 25$

10) $|2x + 10| \leq 14$

Evaluate to the nearest hundredth:

11) $\log_{9.2}(2545.7)$

12) $\log_5(1000)$

Use algebra to find the inverse of the given function

13) $h(x) = \frac{7}{2x+5}$

14) $g(x) = \frac{x+2}{x-6}$

15) If $f(x) = \sqrt{10 - 2x}$, and $g(x) = x + 2$, find

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

b) $(f \circ g)(-9)$

c) Domain of $\frac{f(x)}{g(x)}$

16) Analyze the rational function $\frac{7x-9}{x^2-4x-12}$ algebraically to determine:

a) Domain

b) Vertical Asymptotes

c) Horizontal Asymptotes

d) x and y intercepts

e) Sketch the complete graph in the proper window

17) An organism contains 3,259 bacteria and growing at a rate of 7.5% per day.

a) How many bacteria will the organism contain after 15 days?

b) How long will it take for the bacteria to double?

18) Find the domain, asymptotes, and x-intercepts of the function $f(x) = \text{Log}(x - 3)$, and then sketch its graph.

For the function, identify the amplitude, period, and phase shift. Then draw 1 period of the curve and label the maximum(s), minimum(s), and the x-intercept(s).

19) $f(x) = -\cos\left(3x + \frac{\pi}{2}\right)$

20) $f(x) = 5\sin(4x - 2\pi)$

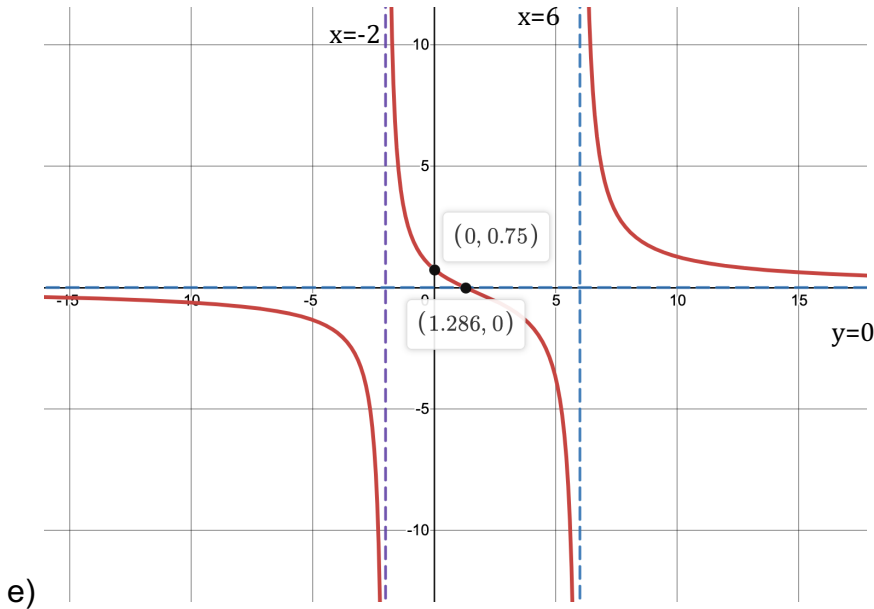
Expand the logarithm.

21) $\text{Log}\left(\frac{x^9 z^7}{y^{15}}\right)$

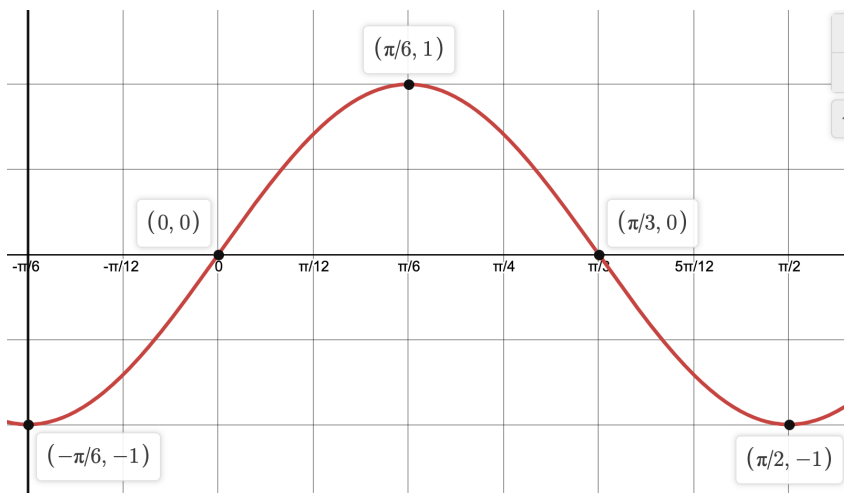
22) $\text{Log}\left(\sqrt{\frac{x^{10}}{y^5}}\right)$

Answer Key

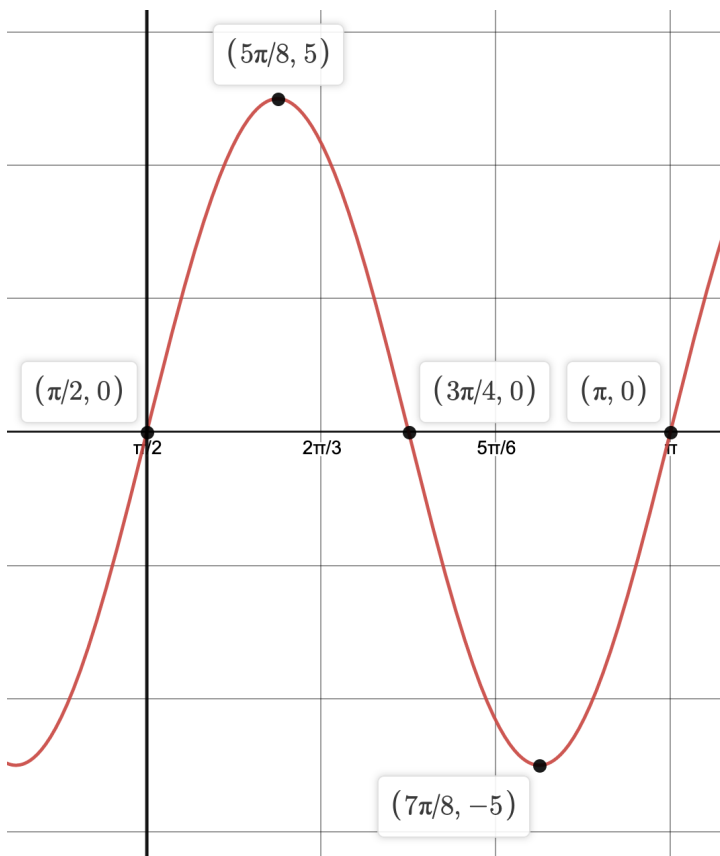
- 1) $2x + h - 3$ 2) $2x + h - 2$ 3) $5, \frac{-3 \pm \sqrt{5}}{2}$ 4) $4, \frac{-7 \pm \sqrt{33}}{2}$
 5) $x = 4^{\frac{12}{7}} = 10.767$ 6) $x = 2.409$ 7) $(-\infty, -5] (3, \infty)$ 8) $(-5, 7)$
 9) $(-\infty, -\frac{11}{2}) (7, \infty)$ 10) $[-12, 2]$ 11) 3.534 12) 4.292
 13) $h^{-1}(x) = \frac{7-5x}{2x}$ 14) $g^{-1}(x) = \frac{6x+2}{x-1}$ 15) a) $\sqrt{6-2x}$ b) $2\sqrt{6}$ c) $(-\infty, -2) (-2, 5]$
 16) a) $(-\infty, -2)(-2, 6)(6, \infty)$ b) $x = 6, x = -2$ c) $y = 0$ d) x-int: $(\frac{9}{7}, 0)$ y-int: $(0, \frac{3}{4})$



- 17) a) 9643 bacteria b) 9.584 days 18) a) D: $(3, \infty)$ VA: $x=3$ x-int: $(4, 0)$
 19) Amp: 1, Pd: $\frac{2\pi}{3}$, PS: $-\frac{\pi}{6}$, x-int: $(0, 0), (\frac{\pi}{3}, 0)$ Max: $(\frac{\pi}{6}, 1)$ Min: $(-\frac{\pi}{6}, -1), (\frac{\pi}{2}, -1)$



20) Amp: 5, Pd: $\frac{\pi}{2}$, PS: $\frac{\pi}{2}$, x-int: $(\frac{\pi}{2}, 0), (\frac{3\pi}{4}, 0), (\pi, 0)$ Max: $(\frac{5\pi}{8}, 5)$ Min: $(\frac{7\pi}{8}, -5)$



21) $9\text{Log}(x) - 15\text{Log}(y) + 7\text{Log}(z)$

22) $5\text{Log}(x) - \frac{5}{2}\text{Log}(y)$