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

For the given function and corresponding root, find the value of C, find the **exact** values of the remaining roots of the function, and draw a sketch of the function, labeling the roots.

3) $f(x) = 2x^3 - 4x^2 - 33x + C$, root $x = 5$

4) $f(x) = x^3 + 11x^2 + 32x + C$, root $x = 4$

Solve the equation and round to the nearest thousandth.

5) $7log_4(x) = 12$

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

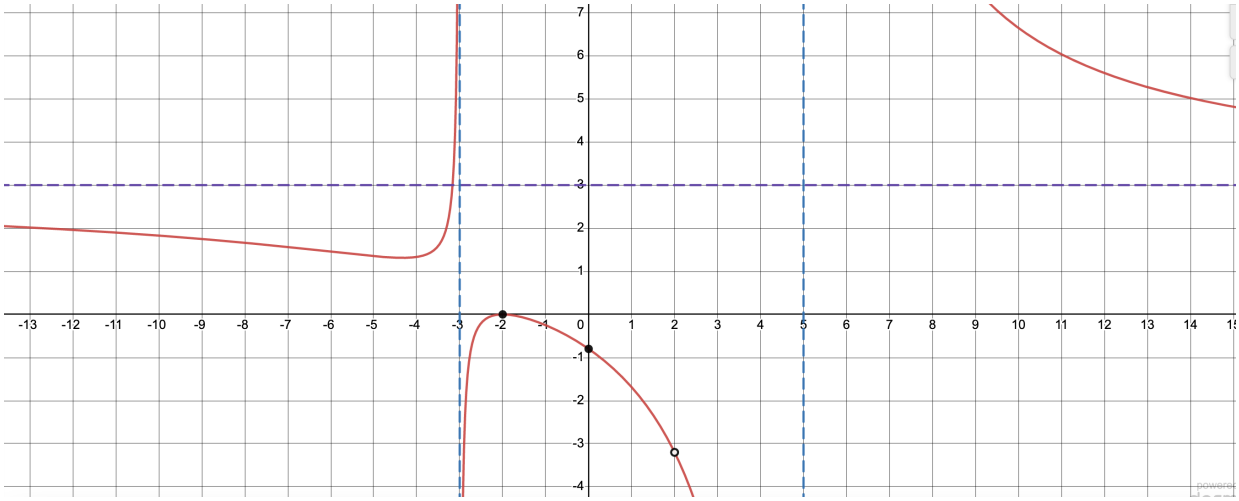
13) $h(x) = \frac{7}{2x+5}$

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

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

a) $(f \odot g)(x)$ b) $(f \odot g)(-9)$ c) Domain of $\frac{f(x)}{g(x)}$

16) For f(x), below, find:



a) Domain b) Vertical & Horizontal Asymptote(s) c) x and y intercept(s)

d) Hole(s) e) Write the function

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?

Expand the logarithm

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

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

20) Find the domain, asymptotes, and x-intercepts of the function $f(x) = Log(x-3)$, and then sketch its graph.

21) Give an expression for f(x), with leading coefficient 2, of degree 3, having roots of $x = 1, and\ x = 1 + 2i$. You may leave your answer in factored form but without imaginary coefficients.

22) Give an expression for f(x) with roots of $x = -2, 6, and\ 1$ with multiplicity 4. f(x) must also intersect $(-3, -9216)$.

Find the **exact** value of

23) $tan\left(-\frac{11\pi}{6}\right)$

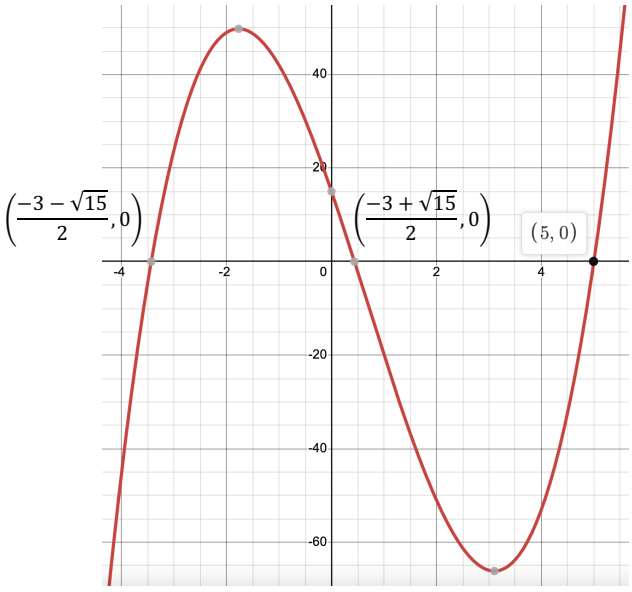
24) $sec\left(-\frac{3\pi}{4}\right)$

Answer Key

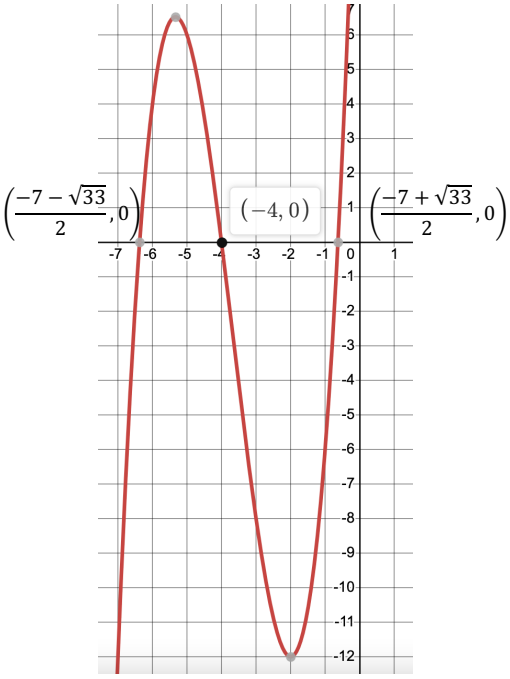
1) $2x + h - 3$

2) $2x + h - 2$

3) $C = 15, Roots: 5, \frac{-3\pm\sqrt{15}}{2}$



4) $C = 16, Roots: 4, \frac{-7\pm\sqrt{33}}{2}$



5) $x = 4^{\frac{12}{7}} = 10.767$

6) $x = 2.409$

7) $(-\infty, -5]\ (3, \infty)$

8) $(-5, 7)$

9) $\left(-\infty, -\frac{11}{2}\right)\ (7, \infty)$

10) $[-12, 2]$

11) 3.534

12) 4.292

Kan

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) $(-\infty,-2)\ (-2,5]$

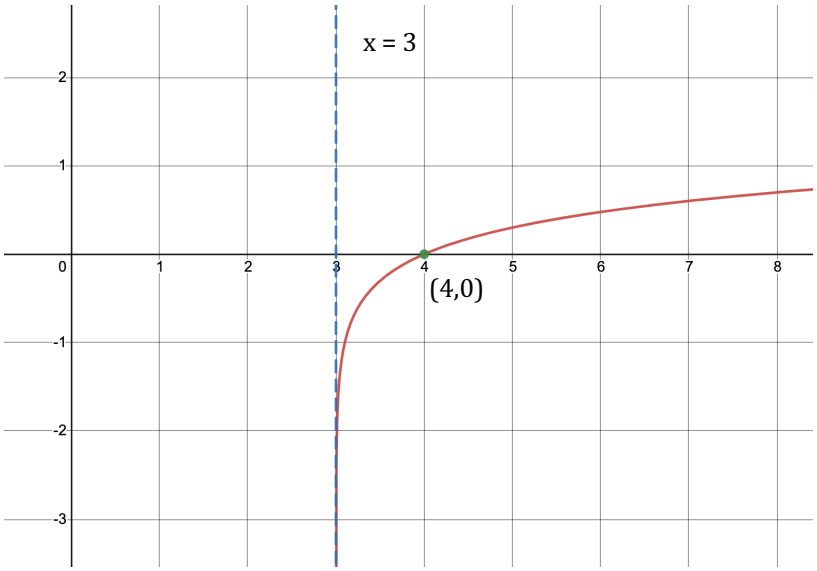
16) a) $(-\infty,-3)(-3,5)(5,\infty)$ b) VA: $x=5, x=-3$, HA: $y=3$

c) x-int: $(-2,0)$ y-int: $\left(0,-\frac{4}{5}\right)$ d) $\left(2,-\frac{16}{5}\right)$ e) f$(x) = \frac{3(x+2)^2(x-2)}{(x-2)(x-5)(x+3)}$

17) a) 9643 bacteria b) 9.584 days

18) $9Log(x) - 15Log(y) + 7Log(z)$ 19) $5Log(x) - \frac{5}{2}Log(y)$

20) a) D: $(3,\infty)$ VA: x=3 x-int: $(4,0)$



21) $f(x) = 2(x-1)(x^2-2x+5)$ 22) $f(x) = -4(x+2)(x-6)(x-1)^4$

23) $\frac{\sqrt{3}}{3}$ 24) $-\sqrt{2}$

Kan