

MAC 1105 Sample Test 5 - KEY

1) Graph $f(x) = x^3 - 3$ for $x \geq -1$

B) Domain f : $[-1, \infty)$

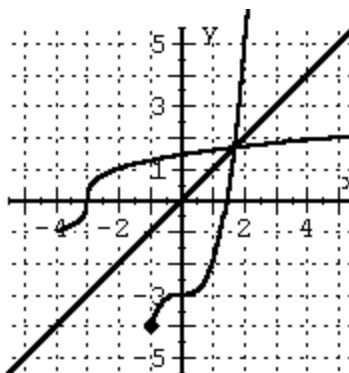
C) Range f : $[-4, \infty)$

D) $f^{-1}(x) = \sqrt[3]{x+3}$

E) Graph $y = x$ and $y = f^{-1}(x)$

F) Domain $f^{-1}(x)$: $[-4, \infty)$

G) Range $f^{-1}(x)$: $[-1, \infty)$



2) A) $\log_3 52 = \frac{\log 52}{\log 3} \approx 3.5966$

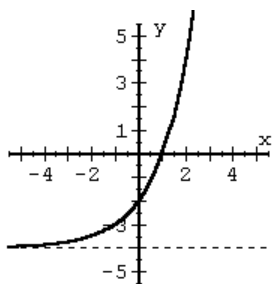
B) $\log_2 e = \frac{\ln e}{\ln 2} = \frac{1}{\ln 2} \approx 1.4427$

3) A) $\log \frac{xy^2}{zw^3} = \log x + 2\log y - \log z - 3\log w$

B) $\ln \frac{x^3 \sqrt{x-2}}{x+4} = 3\ln x + \frac{1}{2}\ln(x-2) - \ln(x+4)$

4) A) $2\log x - \log y + 3\log z = \log \frac{x^2 z^3}{y}$

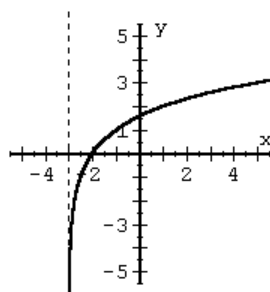
B) $6\log \sqrt[3]{x} - 2\log \sqrt{x} = \log x$



5) Graph $y = 2^{x+1} - 4$

5B) Domain: $(-\infty, \infty)$

5C) Range: $(-4, \infty)$



6) Graph $y = \log_2(x+3)$

6B) Domain: $(-3, \infty)$

6C) Range: $(-\infty, \infty)$

7)

Compounded	Calculator Entry	Amount
Yearly	$50000(1 + 0.065)^8$	\$82,749.78
Monthly	$50000(1 + 0.065 / 12)^{(12 * 8)}$	\$83,983.45
Daily	$50000(1 + 0.065 / 365)^{(365 * 8)}$	\$84,097.49

8) A) $D(1) = 250e^{-0.2(1)} \approx 204.7$ mg

B) $100 = 250e^{-0.2t} \Rightarrow t = \frac{\ln(0.4)}{-0.2} \approx 4.6$ hr.

9) $x = 6$

10) $x = \frac{\log 15}{\log 3} \approx 2.465$

11) $x = \frac{-7}{2} = -3.5$

12) $x = \frac{1002}{5} = 200.4$

13) $x = \frac{e^2}{3} = 2.46$

14) $x = \frac{\ln 4}{0.5} \approx 2.77$