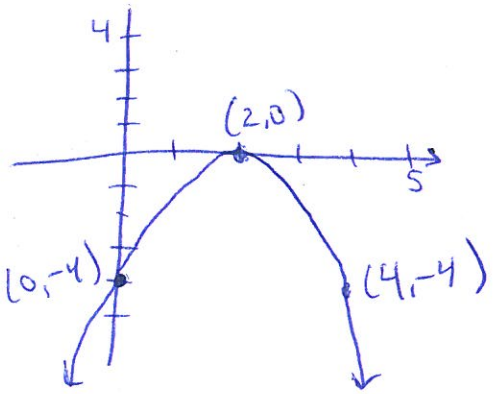
Final Exam Review Solutions

MAC1105 Summer B 2012

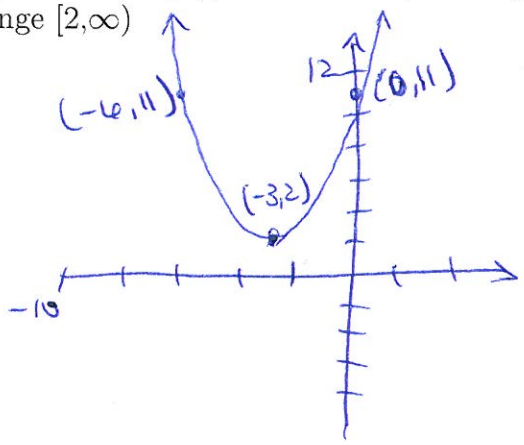
Section I

1. a) False b) True c) True d) False

2. a) Opens down; Vertex $(2, 0)$; Axis $x = 2$; Intercepts $(0, -4), (2, 0)$; domain $(-\infty, \infty)$; range $(-\infty, 0]$

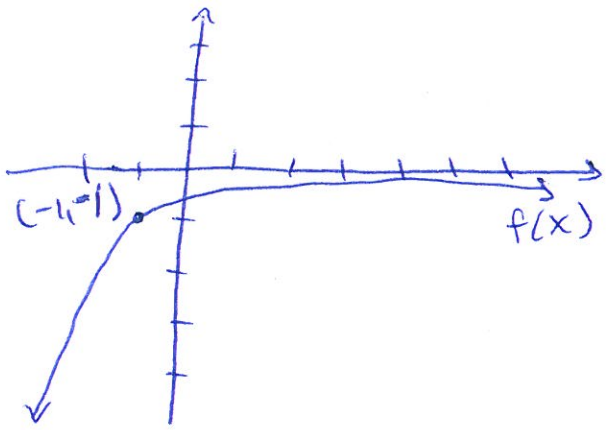


b) Opens up; Vertex $(-3, 2)$; Axis $x = -3$; Intercepts $(0, 11)$, no x-intercepts; domain $(-\infty, \infty)$; range $[2, \infty)$

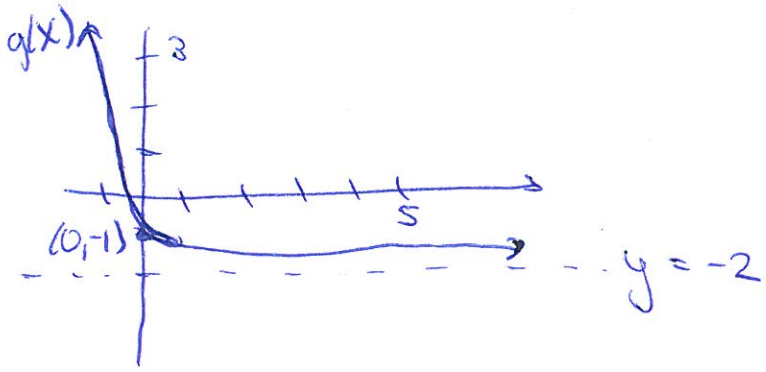


3. Sketch the graph of the following functions using transformations. Find the domain and range of each.

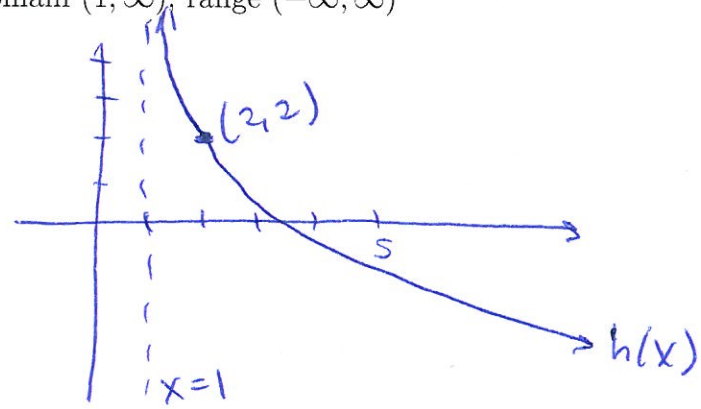
a) domain $(-\infty, \infty)$; range $(-\infty, 0)$



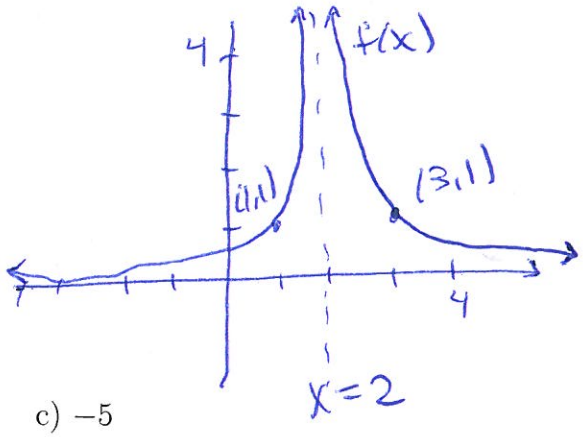
b) domain $(-\infty, \infty)$; range $(-2, \infty)$



c) domain $(1, \infty)$; range $(-\infty, \infty)$



d) domain $(-\infty, 2) \cup (2, \infty)$; range $(0, \infty)$

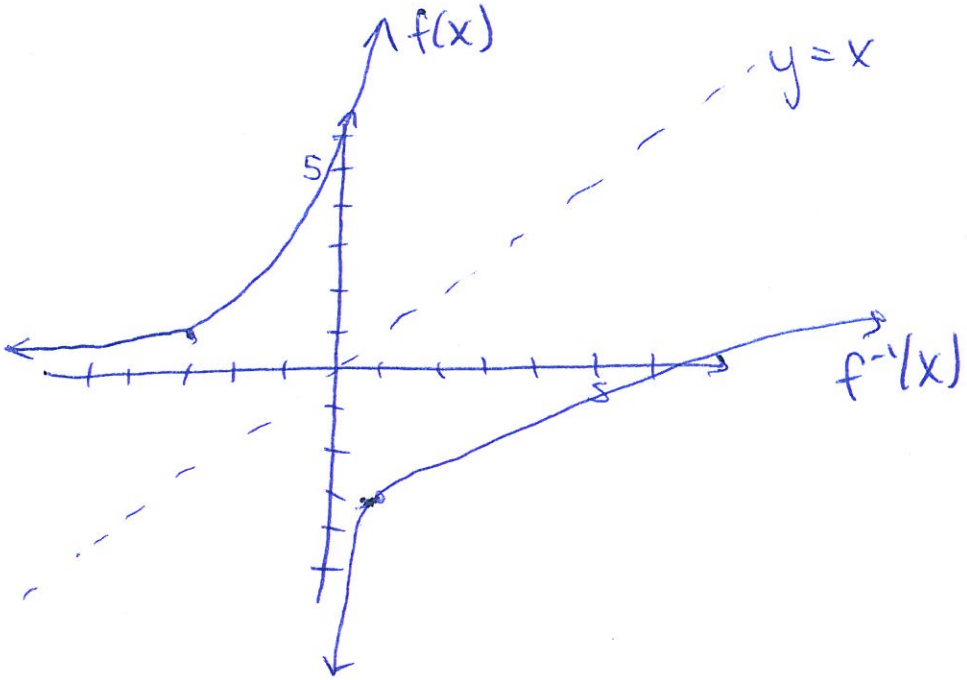


4. a) 3 b) 4 c) -5

5. a) $\log(\frac{1}{100}) = -2$ b) $\log_b 16 = x$ c) $\ln M = -\frac{3}{4}$

6. a) $b^x = 4$ b) $e^0 = 1$ c) $10^K = \sqrt{z}$

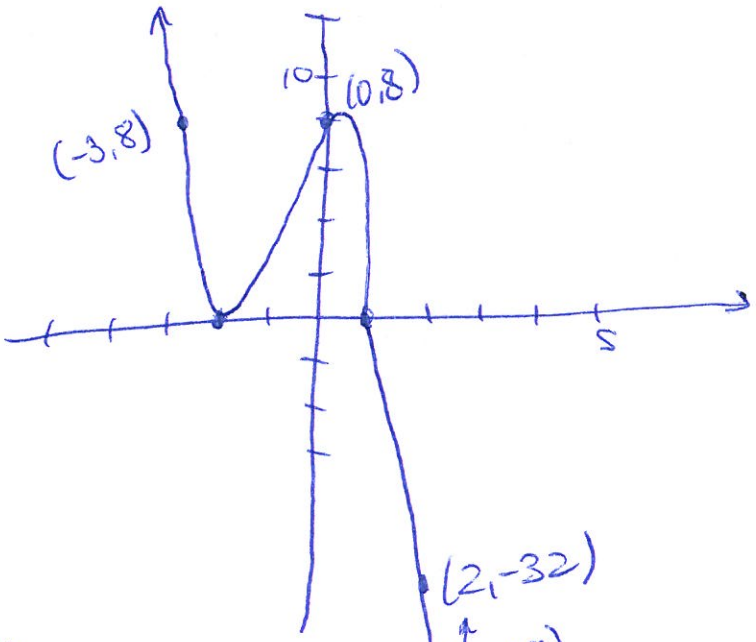
7. $f^{-1}(x) = \ln(x) - 3$



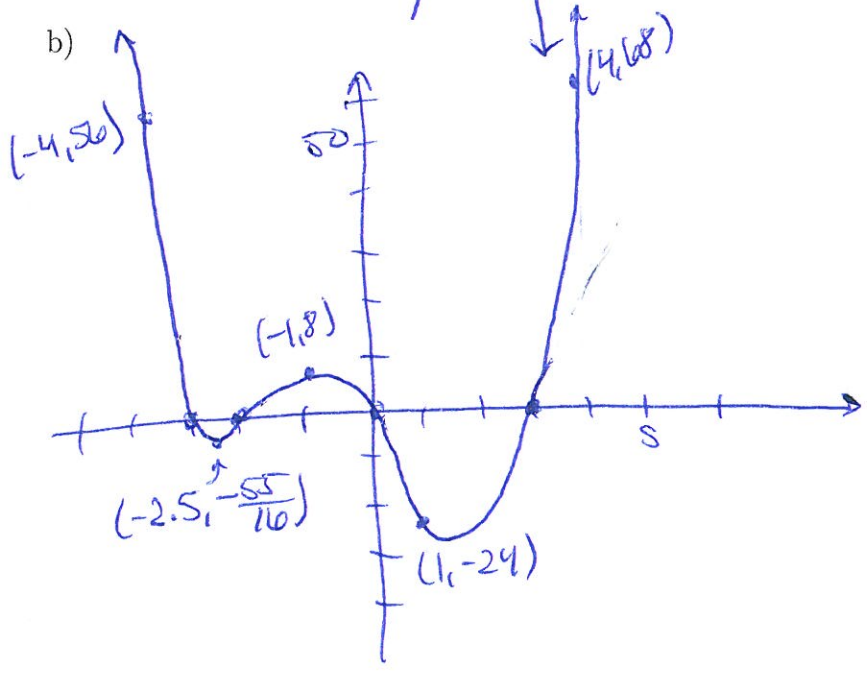
8. $(-\infty, -3) \cup (4, \infty)$

9. a) 6 b) $-3, 1$ c) -1 d) 5 e) $1 - \ln 2$

10. a)



b)



11. a) domain $(-\infty, \infty)$; VA none; HA $y = 0$; Holes none; y-int $(0, 0)$; x-int $(0, 0)$
b) domain $(-\infty, -\frac{1}{2}) \cup (-\frac{1}{2}, 3) \cup (3, \infty)$; VA $x = -\frac{1}{2}$; HA $y = 2$; Hole $(3, \frac{12}{7})$; y-int $(0, 0)$; x-int $(0, 0)$
c) domain $(-\infty, -2) \cup (-2, 2) \cup (2, \infty)$; VA $x = -2$; HA none; Hole $(2, 3)$; y-int $(0, 2)$; x-int none

12. $f(x) = \left(\frac{3}{2}\right)^x$

13. $f(-1) = \frac{1}{2}$, $f(0) = 0$, $f(1) = -2$.

14. 500 x 500 yards; Area 250000 yards^2

15. $t = \frac{3}{2}$ seconds; 100 feet; $t = 4$ seconds

Section II

16. a) $\dfrac{-1 \pm \sqrt{7}}{2}$ b) $\dfrac{3 \pm i\sqrt{3}}{6} = \dfrac{1}{2} \pm \dfrac{\sqrt{3}}{6}i$

17. a) $(-\frac{13}{4}, 2)$ b) $(3, 2)$

18. a) $-\frac{7}{2}$ b) $x^4 + 2x^2 + 1$ c) $\dfrac{-x^2 + 5x - 2}{(x-4)(x-2)}$ d) $\dfrac{x+3}{x}$ e) $13 - 13i$

19. a) $2xy^2\sqrt[3]{y}$ b) $(x - 2x^2)\sqrt{2x} + \sqrt{14x}$ c) $\dfrac{9b^3}{a^4}$

20. $(x+2)^2 + (y-4)^2 = 25$

21. a) $[-7, 9]$ b) $(-\infty, \infty)$ c) no solution $\emptyset$ d) $(-\infty, -11) \cup [\frac{1}{3}, \infty)$

22. a) slope -2 and y-intercept 5 b) $2x + y = -1$ c) $y = \frac{1}{2}x + 3$

23. a) $-\frac{9}{2}$ b) 90 c) 1 d) $\dfrac{-6x - 17}{x + 3}$

24. a) $(0, 2)$ b) $x = -2$ odd; $x = 1$ even c) $(-\infty, -1) \cup (1, \infty)$ d) $(-1, 1)$
e) at $x = -1$, value 4 f) at $x = 1$, value 0

25. 40 Snickers, 60 Milky Way