2015 – 2016 1st Semester Final Exam Review – Answers

Chapter 1/3

1. $u_n = 6n + 15$

2. a. $u_0 = 3$, $u_n = u_{n-1} + 6$ b. $u_0 = 1.7$, $u_n = u_{n-1} - 0.5$ c. $u_0 = -7$, $u_n = u_{n-1} - 11$ d. $u_0 = -7$, $u_n = u_{n-1} + 4$

3. a. point-slope form: $y = \frac{2}{3}(x+8)+6$ intercept form: $y = \frac{2}{3}x + \frac{34}{3}$

   b. point-slope form: $y = -5(x+2)+6$ intercept form: $y = -5x - 4$

   c. point-slope form: $y = -\frac{5}{7}x + 5$ intercept form: $y = -\frac{5}{7}x + 5$

   d. point-slope form: $y = -\frac{1}{3}(x-6) - 18$ intercept form: $y = -\frac{1}{3}x - 16$

   e. point-slope form: $y = -\frac{1}{3}(x+3)+8$ intercept form: $y = -\frac{1}{3}x + 7$

   f. point-slope form: $x = 5$ intercept form: $x = 5$

   g. point-slope form: $y = 12$ intercept form: $y = 12$

4. a. $(2,7)$ b. $(-9,2)$ c. $(5,6)$ d. $(2,-1)$ e. $(-20,10)$

5. a. $b = 22$ b. $n = -22$

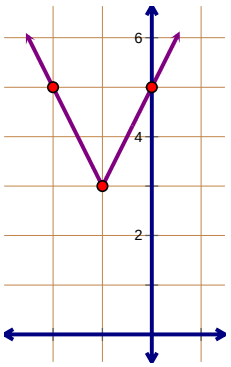
6. They sold 59 gold tickets and 312 silver tickets.

7. They need 35 lbs of peanuts and 15 lbs of raisins for the mix.

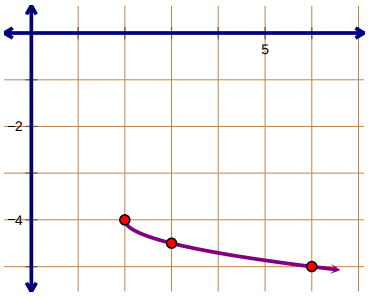
Chapter 4

1. a. -1 b. 0 c. -3 d. 1 e. $x = -4, -2, 1$ f. $x = 2, 5$

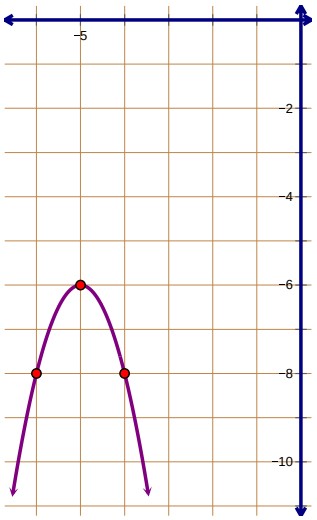
2. a. vertical dilation BAFO 2, left 1, up 3
   Domain: $(-\infty, \infty)$ Range: $[3, \infty)$



   b. reflection over the x-axis, vertical dilation BAFO $\frac{1}{2}$, right 2, down 4
   Domain: $[2, \infty)$ Range: $(-\infty, -4]$



c. reflection over the x-axis, vertical dilation BAFO 2, left 5, down 6
Domain: $(-\infty,\infty)$ Range: $(-\infty,-6]$



3. a. $f(x)=\left(\frac{1}{2}(x+2)\right)^2-3$ b. $g(x)=1+\sqrt{-x}$

c. $(x+1)^2+(y-3)^2=4$ d. $\left(\frac{x-2}{3}\right)^2+\left(\frac{y+1}{4}\right)^2=1$

e. $h(x)=-\left|\frac{x-4}{3}\right|$

4. a. 9 b. 22 c. 58 d. 26 e. $16x^2+16x+9$ f. $4x^2+22$

5. a. Yes b. No c. Yes d. No

6. a. $\frac{2}{3}$ b. 7 c. -2 d. $x=3,\ x=-1$ e. $x=-5,\ x=0$
f. $x=-1,\ x=1,\ x=5$

7. a. D: $[-5,-1)\cup(-1,\infty)$ R: $(-\infty,4]$ b. D: $[-2,5)$ R: $[0,4)$

8. a. $x=-1, x=-17$ b. $x=4, x=-6$

Chapter 5A

1. a. $u_0=49$, $u_n=\frac{1}{7}u_{n-1}$ where $n\geq 1$ b. $y=49\left(\frac{1}{7}\right)^x$

2. a. $u_0=2$, $u_n=3u_{n-1}$ where $n\geq 1$ b. $y=2(3)^x$

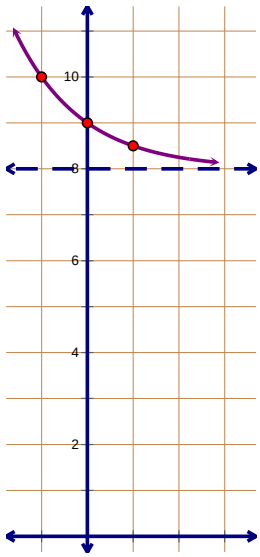
3. a. $u_0 = 300$
$u_n = \frac{2}{3}u_{n-1}$ where $n \geq 1$

b. 59.259 mg

4. a. $f(x) = 2^{x-3} + 1$ b. $g(x) = -(3)^{x+2} - 3$

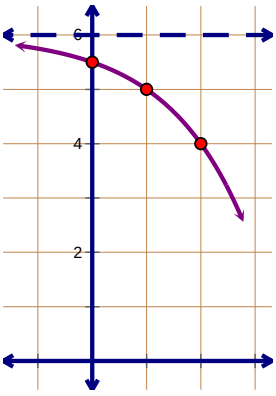
5. a. parent function: $y = \left(\frac{1}{2}\right)^x$ up 8

Domain: $(-\infty, \infty)$ Range: $(8, \infty)$



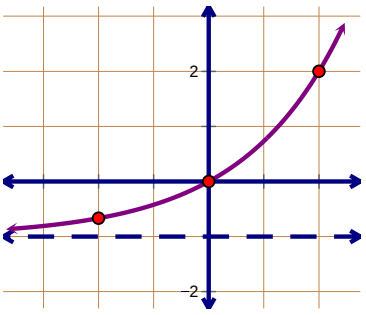
b. parent function: $y = 2^x$ reflection over the x-axis, right 1, up 6

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



c. parent function: $y = 3^x$ horizontal dilation BAFO 2, down 1

Domain: $(-\infty, \infty)$ Range: $(-1, \infty)$



6. a. $-\frac{1}{125}$ b. $18x^2y^4$ c. $\frac{c^9}{729}$ d. $\frac{b^4}{25a^{10}}$ e. $\frac{16y^2}{x^6}$ f. $4m^3n^{16}\sqrt[3]{2mn^2}$

7. a. 243 b. $\frac{15}{4}$ c. –6 d. 4

8. a. $n^{\frac{1}{7}}p^{\frac{4}{7}}$ b. $\sqrt[7]{121}$ c. $129^{\frac{1}{20}}$

9. $y = 32{,}000(0.916)^x \rightarrow \$24{,}594.41$ 10. $15 = a \cdot b^8$ and $11 = a \cdot b^5 \rightarrow y = 6.560(1.109)^x$

11. $4000 = 1000(1+r)^{10} \rightarrow 14.870\%$ 12. $y = 1250(1.0475)^8 \rightarrow \$1811.93$

13. $f(x) = \frac{3}{10}(2)^x$

14. a. $x = 1.76, x = 30^{1/6}$ b. $x = 25.48, x = 17^{8/7}$ c. $x = 1.86, x = 78^{1/7}$ d. $x = 3.13, x = 13^{4/9}$

Chapter 5B

1. a. $f(x) = \log(-x) + 3$ b. $g(x) = -\log_2(x+2)$ c. $g(x) = \log_6(x-2) - 3$

2. a. $w^z = y$ b. $\log_a c = b$ 3. a. 3 b. –3 c. 0 d. 2 e. –2 f. –4

4. a. $x = 1.167$ b. $x = -3.203$ c. $x = \frac{\log 162}{\log 12} - 3$; $x = -0.953$ d. $x = \frac{\log 80}{\log 7} + 4$; $x = 6.252$

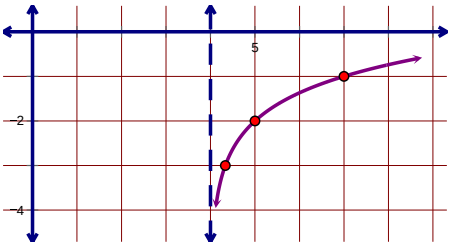
5. a. $\log_4(3y^2)$ b. $\log\left(\frac{25}{y^2}\right)$ c. $\log_x \frac{3}{16}$

6. a. $\log 5 + 3\log x$ b. $4\log_3 x - \log_3 5$ c. $\log 6 + \frac{1}{2}\log x$

7. a. $f^{-1}(x) = 7x + 14$ b. $f^{-1}(x) = \frac{6}{x} + 4$ c. $y = \frac{(x-8)^2 + 3}{2}$

8. 19 9. 15 years 10. $f(x) = 2000(1.075)^x$; in 18.276 years

11. a.



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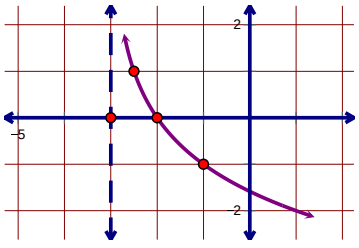
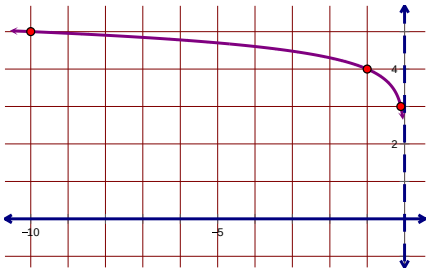


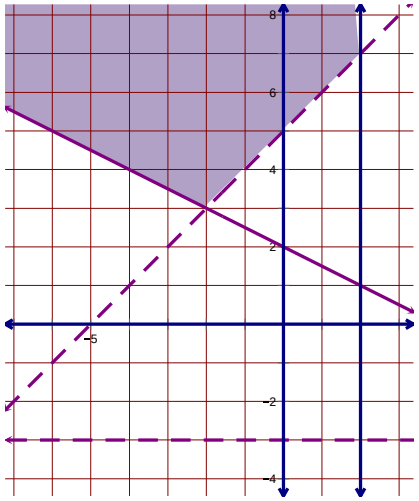
c.

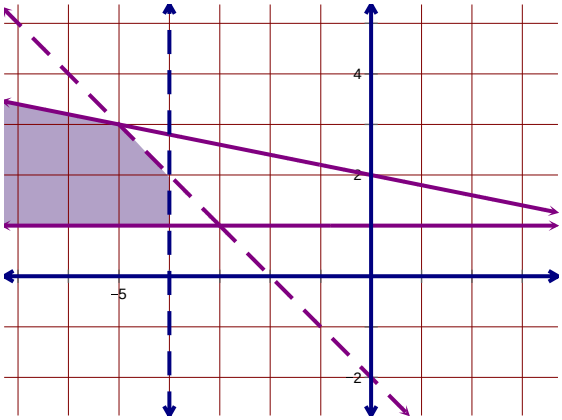


Chapter 6

1. a. $\left(\frac{19}{5}, \infty\right)$ b. $(-\infty, \frac{5}{9}]$ c. $[-5, 2]$ d. $(-\infty, -5] \cup [13, \infty)$ e. $(-\infty, -2) \cup (8, \infty)$

f. $\left(-\infty, \frac{-3}{2}\right) \cup \left(\frac{5}{2}, \infty\right)$ g. $[-13, 13]$ h. $\left(-\infty \frac{-17}{3}\right) \cup (-3, \infty)$

2. a. 

b. 

3. The farmer should plant 30 acres of corn and 30 acres of beans to maximize the profit at $34,950.

4. They should make 0 oak desks and 20 walnut desks to maximize the profit at $10,200.

Chapter 7A

1. $(-4,5);\ a(x)=-2x^2-16x-27$

2. $(2,4);\ b(x)=3x^2-12x+16$

3. $c(x)=x(x+6);\ x=0,-6$

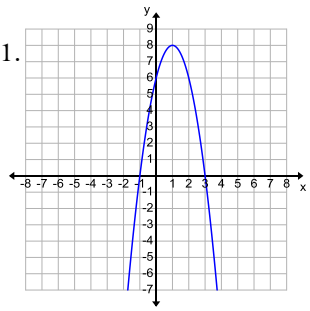
4. $f(x)=(x+6)^2-25;\ (-6,-25)$

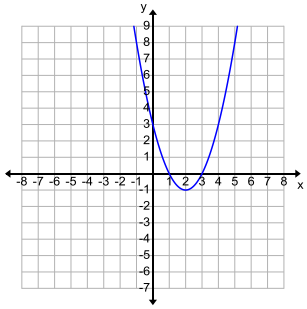
5. $g(x)=2(x-3)^2+10;\ (3,10)$

6. $f(x)=\frac{1}{4}(x+2)(x-6)$

7. $f(x)=-\frac{1}{2}(x-4)^2+3$

8. $f(x)=4x^2+40x+95$

11. 

12. 

13. $-31;\ 2$ non-real roots

14. $x^2(2x+5)(x-6)$

15. $x^2(4x-3)(x+4)$

16. $x=0,6,-\frac{2}{5}$

17. $x=\frac{1}{3}\pm\frac{2\sqrt{3}}{3}$

18. $f(x)=(x-20)^2-391$

19. $g(x)=6(x-1)^2-47$