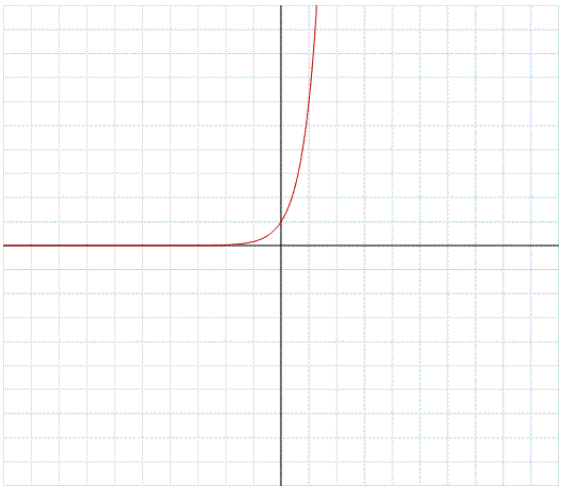
CHAPTER 8 ANSWERS

PROBLEM SET 8-1

1.



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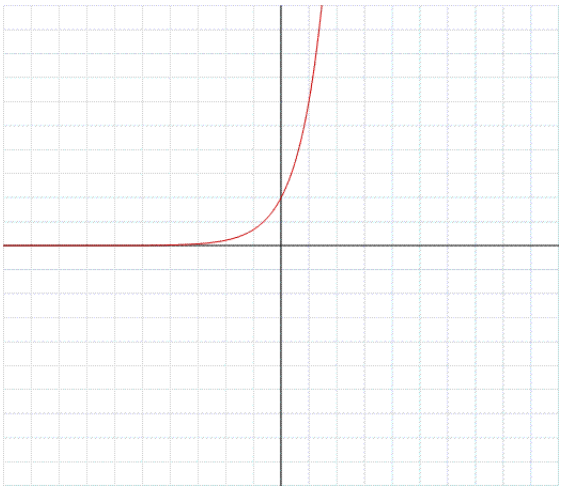

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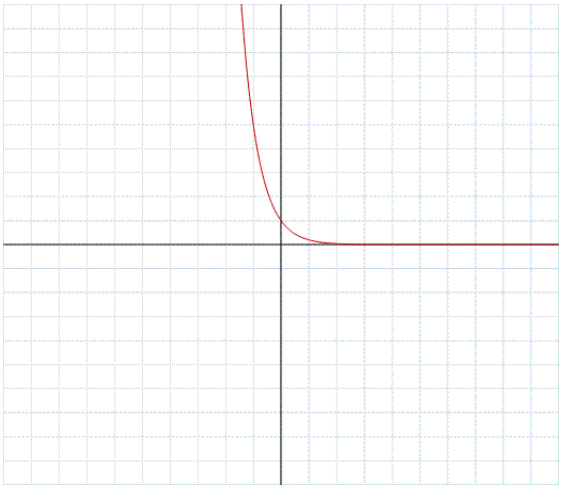

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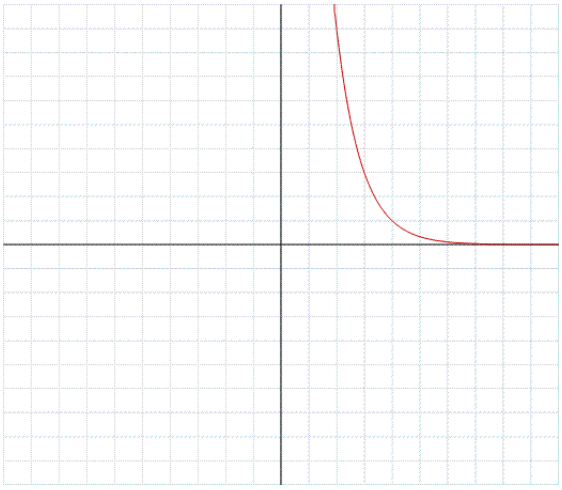


5. $y = \frac{1}{2}(2)^x$

6. $y = 8\left(\frac{3}{2}\right)^x$

7. $y = 3\left(\frac{1}{2}\right)^x$

8. $y = 24\left(\frac{1}{3}\right)^x$

9. Exponential growth

10. Exponential decay

11. Exponential decay

12. Exponential growth

13. 63% increase

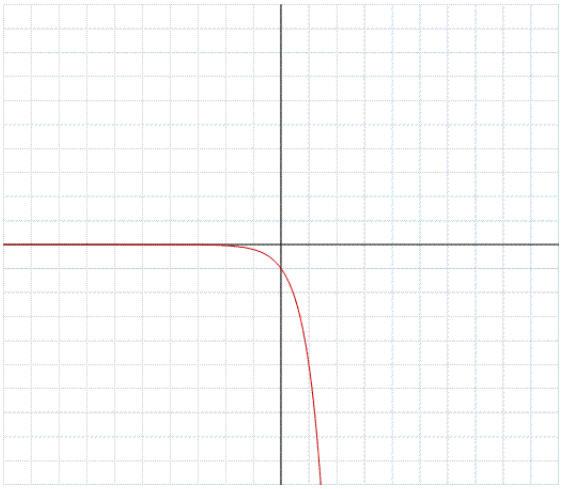
14. 35% decrease

15. Car A: Value = $\$30{,}000(.70)^{\text{Year}}$ Car B: Value = $\$15{,}000(.80)^{\text{Year}}$

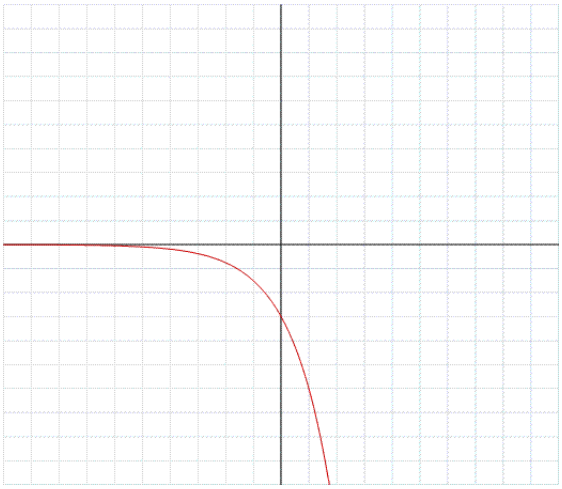
16. Car A will be worth approximately $847; Car B will be worth approximately $1611.

PROBLEM SET 8-2

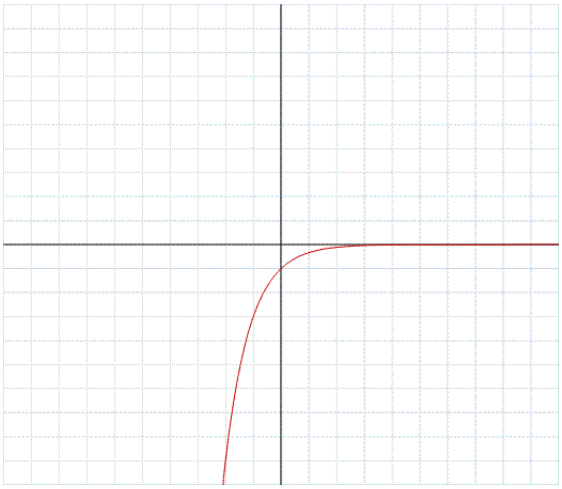
1. Asymptote: $y = 0$



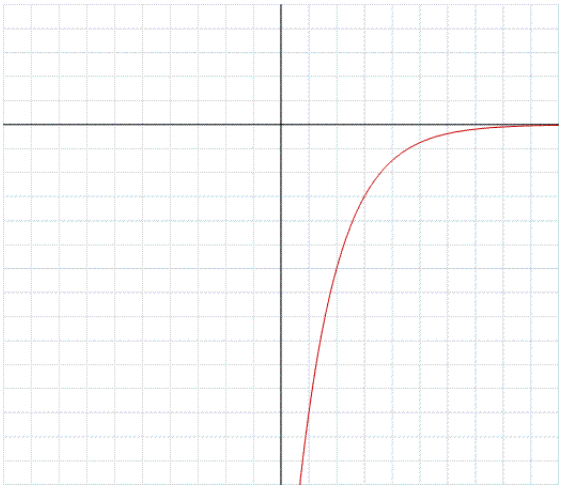
2. Asymptote: $y = 0$



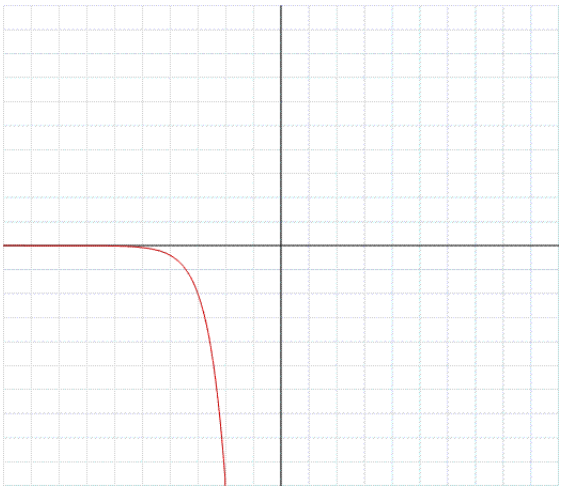
3. Asymptote: $y = 0$



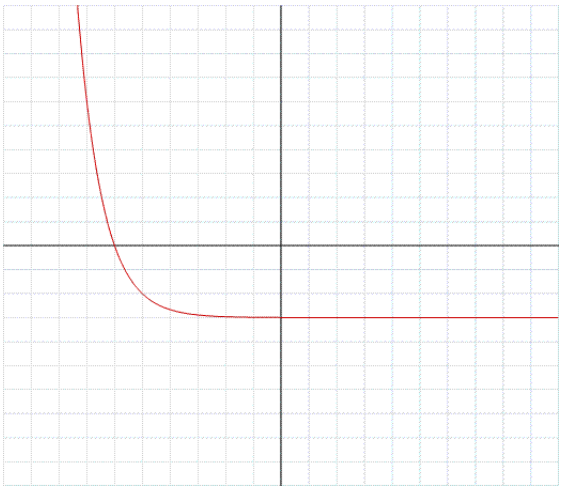
4. Asymptote: $y = 0$



5. Asymptote: $y = 0$



6. Asymptote: $y = -3$



7. $2330.65

8. $448.30

9. $1819.76

10. $6168.41

PROBLEM SET 7-7

1. $f^{-1}(x) = \frac{1}{3}x - \frac{1}{3}$; Yes

2. $f^{-1}(x) = \frac{1}{2}x + \frac{1}{2}$; Yes

3. $f^{-1}(x) = \pm\sqrt{x-4}$; No

4. $f^{-1}(x) = \pm\sqrt{\frac{x+5}{3}}$; No

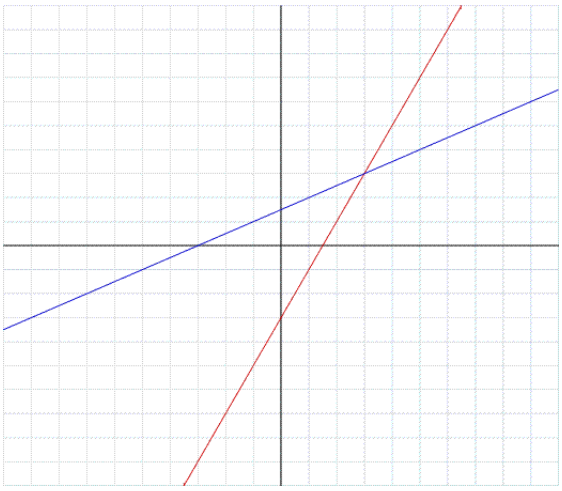
5. $f^{-1}(x) = -1 \pm \sqrt{x+1}$; No

6. $f^{-1}(x) = \sqrt[3]{x}$; Yes

7. 10

8. – 10

9.



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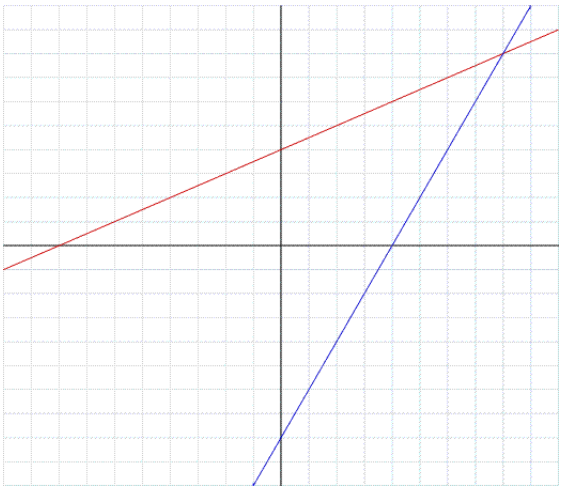

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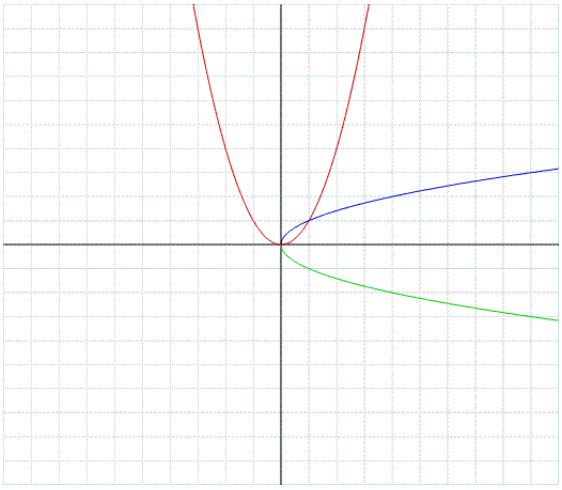

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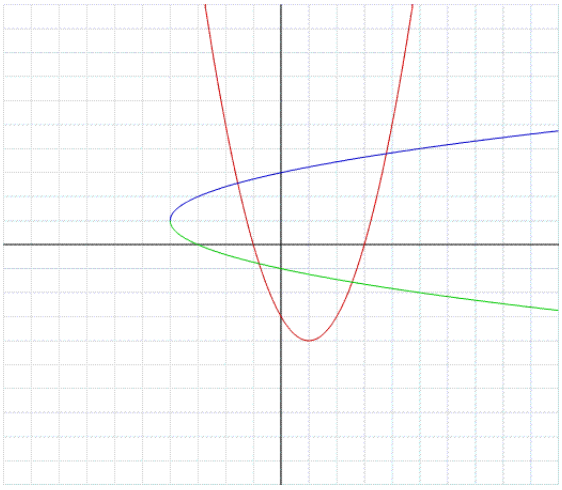


PROBLEM SET 8-3

1. $\log_7 49 = 2$

2. $\log_5 625 = 4$

3. $2 = \log_8 64$

4. $\log \frac{1}{10} = -1$

5. $-2 = \log_{\frac{1}{2}} 4$

6. $3 = \log_{\frac{1}{3}} \left(\frac{1}{27}\right)$

7. $128 = 2^7$

8. $6 = 6^1$

9. $10 = 10^1$

10. $\frac{1}{9} = 3^{-2}$

11. $\frac{1}{2} = 2^{-1}$

12. $\left(\frac{1}{2}\right)^{-1} = 2$

13. 4

14. 1

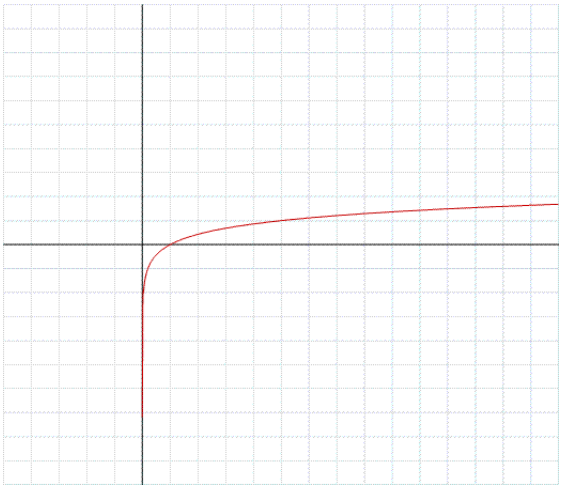
15. $\frac{3}{2}$

16. $\frac{1}{2}$

17. 5

18. 4

19.



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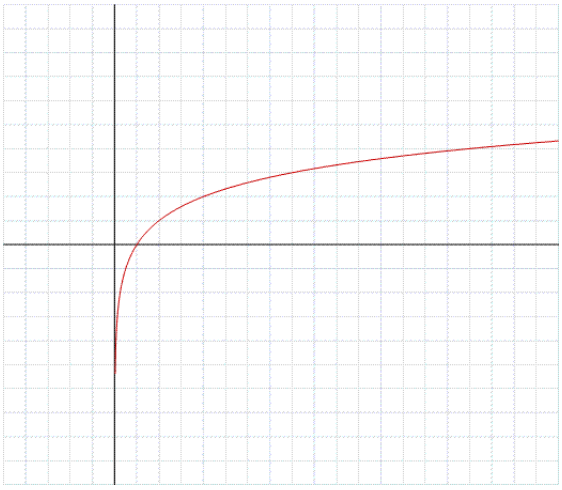

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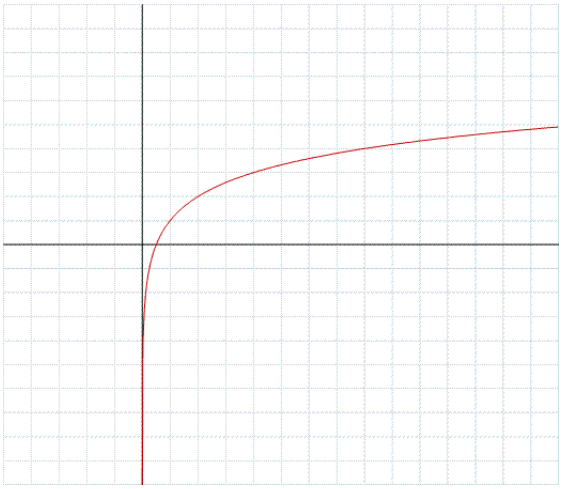

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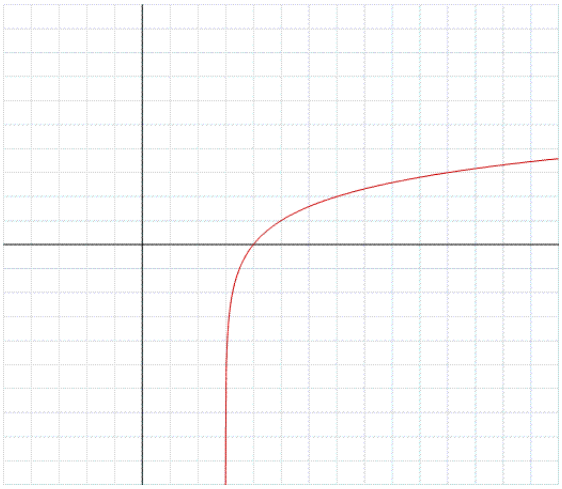

PROBLEM SET 8-4

1. $\log 14$

2. $\log_2 3$

3. $\log 972$

4. $\log \frac{2}{3}$

5. $\log_3 \sqrt[4]{2x}$

6. $\log \frac{27}{2}$

7. $\log_x \frac{2\sqrt{y}}{z^3}$

8. $\log_b \frac{\sqrt[3]{x^2}\,\sqrt[4]{y^3}}{z^5}$

9. $3\log x + 5\log y$

10. $\log_4 5 + \frac{1}{2}\log_4 x$

11. $\log_5 r - \log_5 s$

12. $2\log_3 2 + 2\log_3 x$

13. $2\log a + 3\log b - 4\log c$

14. $1 + \frac{1}{2}\log_8 3 + \frac{5}{2}\log_8 a$

15. -2

16. 6

17. 2

18. 1

19. -2

20. 1

21. 1.3803

22. 1.4772

23. -0.6021

24. 0.3495

PROBLEM SET 8-5

1. 3.1699; $\log_8 729$

2. 1.5; $\log_8 22.627$

3. 3.6309; $\log_8 1901.3$

4. 2.5643; $\log_8 206.93$

5. .05

6. 33

7. 2

8. 5

9. $\frac{1}{4}$

10. 7

11. 625

12. 10

13. 2.9315

14. .8505

15. 2.7944

16. 1.0451

17. 1.3063

18. 3.0417

19. 1

20. 2.9615

PROBLEM SET 8-6

1. 134.4763

2. .1354

3. 1488.9790

4. ± 11.5883

5. ± 2.2408

6. $\pm .9079$

7. 542.3095

8. 81.2858

9. 78.3421

10. 2.8904

11. 2.4012

12. 1.2425

13. 5.4931

14. .0794

15. No solution

16. 1

17. 10

18. 10

19. Sometimes

20. Never

21. Always