

MATH 1120 Test #1 Review Answer Key

Section 1.1

77. 62.5% 78. 1396.7% 79. -39.3% 80. -4.9%
81. \$106 per credit; no, it is \$99.64 82. About 1085%

Section 1.2

93. a) x-min: 2005; x-max: 2008; y-min:19.7; y-max: 25.0

b) [2003, 2010, 1] by [15, 30, 5] *Answers may vary*

c) See Figure 93c d) See Figure 93d

[2003, 2010, 1] by [15, 30, 5]

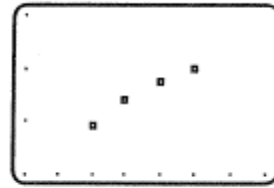


Figure 93c

[2003, 2010, 1] by [15, 30, 5]

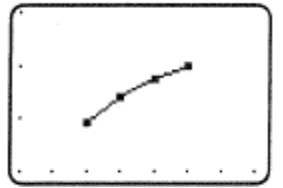


Figure 93d

94. a) x-min: 2005; x-max: 2008; y-min:15.1; y-max: 21.7

b) [2003, 2010, 1] by [10, 25, 5] *Answers may vary*

c) See Figure 94c d) See Figure 94d

[2003, 2010, 1] by [10, 25, 5]

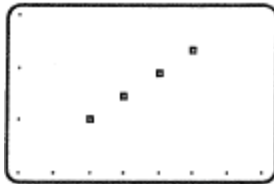


Figure 94c

[2003, 2010, 1] by [10, 25, 5]

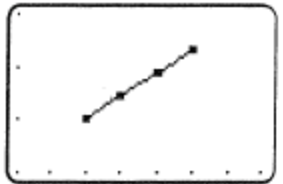


Figure 94d

95. x-min: 1950; x-max: 2000; y-min:1.7; y-max: 5.5

b) [1940, 2010, 10] by [0, 7, 1] *Answers may vary*

c) See Figure 95c d) See Figure 95d

[1940, 2010, 10] by [0, 7, 1]

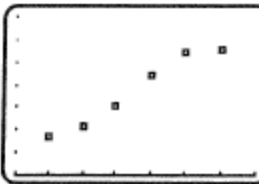


Figure 95c

[1940, 2010, 10] by [0, 7, 1]

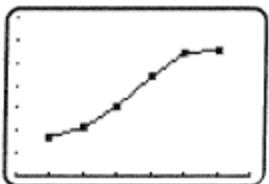


Figure 95d

96. x-min: 1998; x-max: 2006; y-min:10.5; y-max: 14.0

b) [1996, 2008, 2] by [0, 20, 5] *Answers may vary*

c) See Figure 96c d) See Figure 96d

[1996, 2008, 2] by [0, 20, 5]

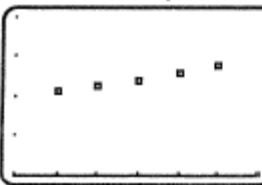


Figure 96c

[1996, 2008, 2] by [0, 20, 5]

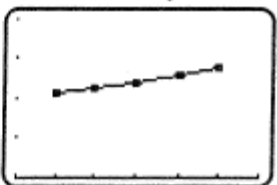


Figure 96d

Checking Basic Concepts for Sections 1.1 and 1.2

1. a) 9.88 b) 1.28 2. a) -43 b) 2
3. a) 3.485×10^8 b) -1.2374×10^3 c) 1.98×10^{-3}

Checking Basic Concepts for Sections 1.3 and 1.4

1. Symbolic: $f(x) = 5280x$

Numerical: Use table f starting at x

x	1	2	3	4	5
$f(x)$	5280	10,560	15,840	21,120	26,400

Figure 1a

$x = 1$, incrementing by 1. See Figure 1a.

Graphical: Graph $Y_1 = 5280X$ as shown in Figure 1b.

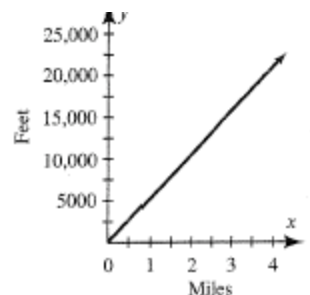


Figure 1b

2. a) $f(2) = \frac{2(2)}{2-4} = \frac{4}{-2} = -2$ $f(a+4) = \frac{2(a+4)}{(a+4)-4} = \frac{2a+8}{a}$

b) The function is undefined when the denominator $x - 4 = 0$. This happens when $x = 4$; therefore, $D = \text{all real numbers}$; $R = \{x \mid x \neq 4\}$.

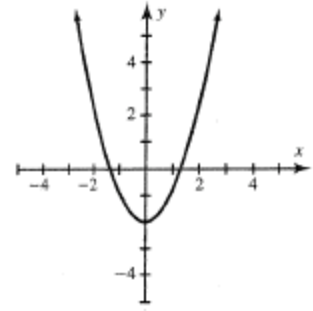


Figure 3

3. See Figure 3. $D = \text{all real numbers}$; $R = \{y \mid y \geq -2\}$

Chapter 1 Review Exercises

1. -2 is an integer, rational number, and real number. $\frac{1}{2}$ is both rational and a real number. 0 is an integer, rational number, and real number. 1.23 is both a rational and a real number. $\sqrt{7}$ is a real number. $\sqrt{16} = 4$ is a natural number, integer, rational number and real number.

2. 55 is a natural number, integer, rational number and real number. 1.5 is both a rational and a real number. $\frac{104}{17}$ is both a rational and a real number. $2^3 = 8$, is a natural number, integer, rational number and a real number. $\sqrt{3}$ is a real number. -1000 is an integer, rational number and real number.

3. $1,891,000 = 1.891 \times 10^6$ 4. $0.0001001 = 1.001 \times 10^{-4}$ 5. $1.52 \times 10^4 = 15,200$

6. $-7.2 \times 10^{-3} = -0.0072$ 7. a) 32.07 b) 2.62 c) 5.21 d) 49.12

8. a) $2 \times 10^{-1} ; 0.2$ b) $5 \times 10^{-4} ; 0.0005$ 9. -41 10. -108

13. a) $S = \{(-15, -3), (-10, -1), (0, 1), (5, 3), (20, 5)\}$
 b) $D = \{-15, -10, 0, 5, 20\}$ and $R = \{-3, -1, 1, 3, 5\}$

14. a) $S = \{(-0.6, 10), (-0.2, 20), (0.1, 25), (0.5, 30), (1.2, 80)\}$
 b) $D = \{-0.6, -0.2, 0.1, 0.5, 1.2\}$ and $R = \{10, 20, 25, 30, 80\}$

15. The relation is not a function since both (10,13) and (10,20) are contained in the set. Notice that these points are lined up vertically. See Figure 15.

16. The relation is a function. See Figure 16.

24. a) $D = \{x \mid -2 \leq x \leq 2\}$ and $R = \{y \mid -2 \leq y \leq 0\}$; $f(-2) = 0$
 b) $D = \text{all real numbers}$ and $R = \{y \mid y \leq 2\}$; $f(-2) = 2$

25. See Figure 25

26. See Figure 26

27. See Figure 27

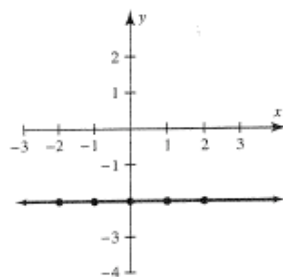


Figure 25

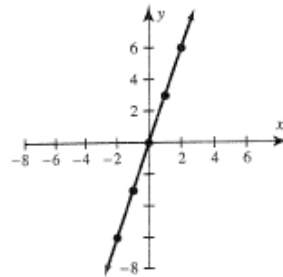


Figure 26

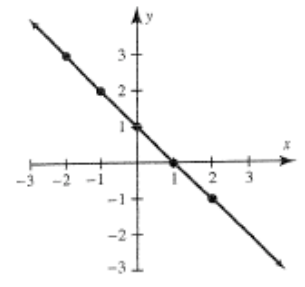


Figure 27

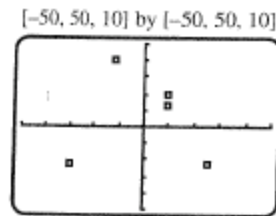


Figure 15

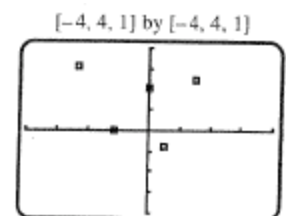


Figure 16

28. See Figure 28

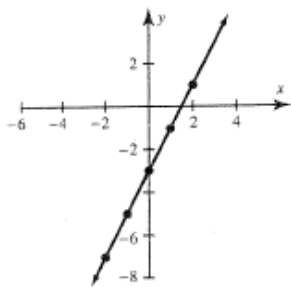


Figure 28

29. See Figure 29

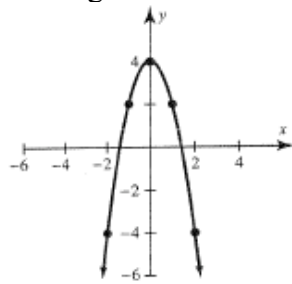


Figure 29

30. See Figure 30

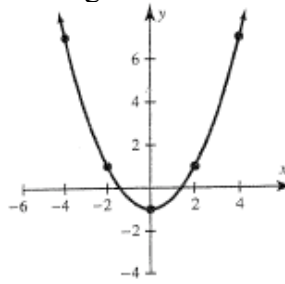


Figure 30

31. See Figure 31

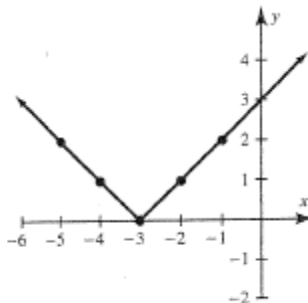


Figure 31

32. See Figure 32

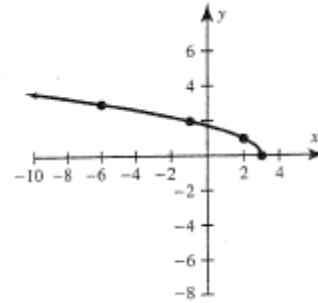


Figure 32

33. Symbolic: $f(x) = 16x$

Numerical: Table f starting at $x = 0$, incrementing by 25. See Figure 33a.

Graphical: Graph $Y_1 = 16X$ in $[0, 100, 10]$ by $[0, 1800, 300]$ See Figure 33b.

x	0	25	50	75	100
$f(x)$	0	400	800	1200	1600

Figure 33a

$[0, 100, 10]$ by $[0, 1800, 300]$

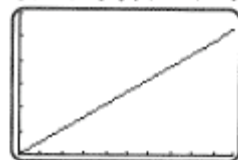


Figure 33b

34. Symbolic: $f(x) = x^2$

Numerical: Table f starting at $x = 0$, incrementing by 25. See Figure 34a.

Graphical: Graph $Y_1 = X^2$ in $[0, 100, 10]$ by $[0, 12000, 1000]$ See Figure 34b.

x	0	25	50	75	100
$f(x)$	0	625	2500	5625	10,000

Figure 34a

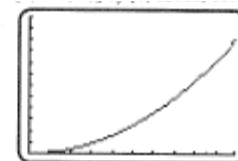


Figure 34b

35. a) $f(-8) = -2, f(1) = 1$

b) All real numbers

36. a) $f(-2) = -4, f(5) = 17$

b) All real numbers

37. a) $f(-3) = 5, f(1.5) = 5$

b) All real numbers

38. a) $f(-5) = 29, f(6) = -26$ b) All real numbers

39. a) $f(-10) = 97, f(a+2) = a^2 + 4a + 1$ b) All real numbers

40. a) $f(-10) = -970, f(a+1) = a^3 + 3a^2 - 2$ b) All real numbers

42. a) $f(1) = 2, f(a-3) = \sqrt{a}$ b) $D = \{x \mid x \geq -3\}$

43. No

45. Yes

46. No

47. Yes

48. No

65. 760 sec

66. About 0.000796 in.

67. 198 ft.

Section R.2

14. 4^{-3}

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

31. $\frac{64}{27}$

38. $18y$

44. $30x^{-2}y = \frac{30y}{x^2}$

50. $2x^8$

54. $\frac{-4y^4}{3x^2}$

60. $\frac{1}{16x^4y^{12}}$

63. $\frac{z^{20}}{32x^5}$

69. $\frac{3a}{2b}$

70. $5b^2$

72. $\frac{4t^3}{r^3}$

77. $\frac{27t^9}{8}$

82. $\frac{a^8}{81b^{12}}$

83. $\frac{2y^2}{x}$

87. y

89. $\frac{125r^{15}}{t^9}$

90. $\frac{4x^2}{y^{16}}$