

## MA 111 Even Homework Answers

### Section 1.1

4.  $2x$   
 8.  $\frac{1}{2}y \square 6$   
 12.  $mn + 2$   
 16. 27  
 24. 3  
 28. 13  
 30. 3.045 sq m  
 32. 7.2 sq ft  
 42.  $\{x \mid x \text{ is an integer greater than } -4 \text{ and less than } 3\}$   
 46. False  
 48. True  
 50. False  
 62.  $3(m^3 + n^3)$   
 64.  $(x \square y)(x + y)$

### Section 1.2

2. 7  
 8.  $3\frac{3}{4}$   
 16. 7 is greater than or equal to -2, true  
 32.  $\square \frac{1}{40}$   
 34.  $\square 9.6$   
 36.  $\frac{3}{10}$   
 38.  $\square 3.19$   
 42.  $\square 6.6$   
 50. -3  
 52. 1.9  
 62. 6  
 68.  $\square \frac{13}{15}$   
 70.  $\square 1.1$   
 76. 56  
 84. 8.17  
 86. 5  
 88. -10  
 94.  $\frac{1}{3}$   
 102.  $\frac{5}{21}$   
 106.  $\frac{1}{33}$   
 110. -3  
 114.  $\frac{55}{2}$   
 118. 79  
 132.  $8x + 8$   
 138.  $5xy \square 5xz + 5xw$

### Section 1.3

10.  $y = 6.9$   
 18.  $x = 14$   
 24.  $8a^2$   
 26.  $14x$   
 32.  $13a \square 5a^2$   
 46.  $\square 15y \square 45$   
 50.  $47b \square 51$   
 58.  $t = 13$   
 64.  $y = 1$   
 68.  $x = 7$   
 70.  $t = \square 7$   
 72.  $x = \frac{37}{5}$   
 78.  $t = \frac{22}{5}$   
 92.  $0.42 \square \frac{n}{2} \square \square$

### Section 1.4

4. Let  $t$  = time (hours) it will take Fran to swim 1.8 km upriver:  
 $2.7t = 1.8$   
 6. Let  $t$  = time (hours):  $325t = 725$   
 8. let  $w$  = wholesale price:  
 $w + 0.5w + .25 = 1.99$   
 10. Let  $b$  = original amt of bill  
 $b - 0.05b = 142.50$   
 12. Let  $x$  = longer length:  
 $x + \frac{2}{3}x = 10$   
 14. Let  $x$  = measure of the second angle:  $4x + x + (2x + 5) = 180$   
 16. Let  $x$  = first odd number  
 $n + 2(n + 2) + 3(n + 4) = 70$   
 18. Let  $x$  = length of one piece  
 $\frac{\square x \square^2}{\square 4 \square} = \frac{\square 100 \square x \square^2}{\square 4 \square} + 144$   
 42. 36

### Section 1.4 (cont)

22. 156.7  
 24. 1368  
 26. 13.5  
 28. length 7 cm width 3.5 cm  
 30. length 12 m width 4 m  
 34.  $96^\circ, 32^\circ, 52^\circ$   
 44.  $\frac{4}{3}$

### Section 1.5

8.  $r = \frac{I}{Pt}$   
 12.  $t = \frac{P \square b}{0.5}$

14.  $w = \frac{p \square 2h \square l}{2}$   
 16.  $y = \frac{12 \square 2x}{3}$  or  $y = 4 \square \frac{2}{3}x$   
 18.  $l = \frac{P \square 2w}{2}$  or  $\frac{P}{2} \square w$   
 22.  $\square = \frac{3V}{4r^3}$   
 32.  $x = \frac{p}{1 \square yz}$   
 36. \$1571.43  
 44. 25 ft  
 48. about 7.7 hr  
 52.  $4 \cdot x \cdot y \cdot y; (y \cdot 4)(x \cdot y)$

### Section 1.6

2.  $2^7$   
 20.  $5x^6y^6$   
 22.  $\square 6x^6y^3z^6$   
 48.  $\frac{x^3}{y^5}$   
 64.  $\frac{1}{9^7}$   
 68. 1  
 88.  $a^6$   
 90.  $\frac{1}{8^{12}}$   
 106.  $\frac{8x^9y^3}{27}$   
 108. 1

### Section 1.7

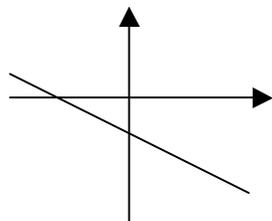
2.  $2.6 \square 10^{12}$   
 10.  $3.09 \square 10^{12}$   
 12.  $8.02 \square 10^{12}$   
 16. 0.00005  
 20. 0.07034  
 28.  $3.4 \square 10^{14}$   
 30.  $3.5 \square 10^{11}$   
 48.  $3.2 \square 10$   
 68. 32

### Section 2.1

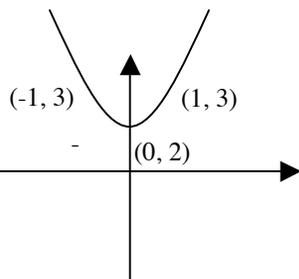
10. IV  
 12. III  
 16. Yes  
 26. No

**Section 2.1 (cont)**

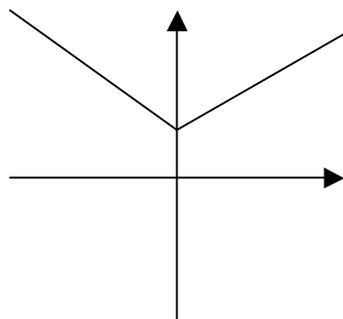
42.



46.



52.



68. IV, III, I, II

**Section 2.2**

2. Yes

6. No

18. a)3 b)  $\{x \mid 4 \leq x \leq 3\}$

c)0 d)  $\{y \mid 5 \leq y \leq 4\}$

20. (a) 4

(b)  $\{x \mid 3 \leq x \leq 4\}$

(c) -1

(d)  $\{y \mid 0 \leq y \leq 5\}$

28. No

30. No

34. Yes

66. -1

**section 2.2 (cont)**

38. (a)  $g(0) = 0$

(b)  $g(1) = 5$

(c)  $g(3) = 21$

(d)  $g(t) = 3t^2 - 2t$

(e)  $g(2a) = 12a^2 - 4a$

40. (a)  $\frac{26}{25}$

(b)  $\frac{2}{9}$

(c)  $\frac{5}{12}$

(d)  $\frac{7}{3}$

(e)  $\frac{3x+5}{2x+11}$

46.  $100\pi$  or  $314.16 \text{ cm}^2$

48.  $41^\circ\text{F}$

52. 125 per 10,000 men

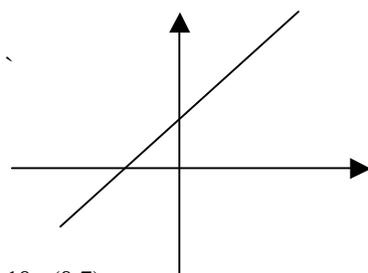
56. 3 drinks

60. about 80,000

70.  $y = \frac{5}{4}x - 2$

**Section 2.3**

6.



10. (0,7)

12. (0,2.2)

18. slope =  $\frac{4}{3}$

20. slope =  $\frac{3}{26}$

38. slope =  $\frac{5}{4}$ ; (0,1)

46.  $f(x) = \frac{3}{4}x + 12$

48.  $f(x) = 2x - 1$

50. slope =  $\frac{5}{4}$ ; (0,1)

54. The distance from the finish line is decreasing at a rate of  $6\frac{2}{3}$  m per second.

58. The distance from home is increasing at a rate of 0.25 km per minute.

70. 0.05 signifies that a salesperson earns 5% commission on sales; 200 signifies that a salesperson earns a base salary of \$200 per week.

**Section 2.3 (cont)**

72.  $\frac{1}{8}$  signifies that the grass grows  $\frac{1}{8}$  in per day; 2 signifies that the grass is 2 in long when cut.

78. 0.3 signifies that the cost per mile of renting the truck is \$0.30; 20 signifies that the minimum cost is \$20.

80. -2000 signifies that the depreciation is \$2000 per year; 15,000 signifies that the original value of the machine was \$15,000.

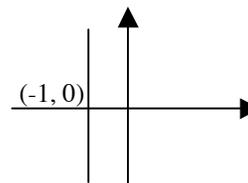
88. 3

**Section 2.4**

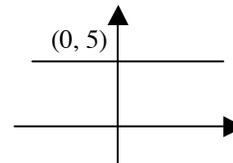
6. slope=0

18. slope =  $\frac{3}{2}$

20.



22.



34. (4,0); (0,-5)

36. (4,0); (0,6)

38. (5,0); (0,-3)

60. 1 hr

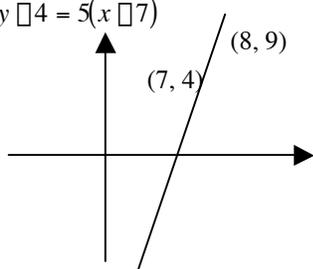
64. equation is linear; slope =  $\frac{3}{5}$

80.  $2x - 8$

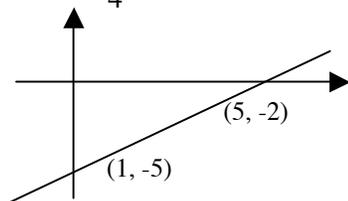
82.  $\frac{3}{2}x - \frac{12}{5}$

**Section 2.5**

2.  $y - 4 = 5(x - 7)$



10.  $y + 5 = \frac{3}{4}(x - 1)$



14. slope =  $\frac{2}{9}$ ;  $(-5, 1)$

20.  $f(x) = 4x + 1$

32.  $f(x) = \frac{4}{3}x - 4$

78.  $5t^2 - 6t - 3$

**Section 2.5 (cont)**

38. (a)  $A(p) = 2.5p + 26.5$

(b) 11.5 million lb

40. (a)  $A(p) = 2p - 11$

(b) 1 million lb.

44. (a)  $P(d) = .03d + 1$

(b) 21.7 atm

46. Yes, the lines are parallel

56.  $y = \frac{5}{2}x - \frac{35}{2}$

68.  $y = \frac{2}{5}x - \frac{31}{5}$

82. -34

88. \$11,000

**Section 2.6**

2. 7

8.  $\frac{8}{11}$

12.  $x^2 + 3x + 1$

16. 33

18. -1

22.  $x^2 - x + 7$

54. 0; 2

64.  $y = \frac{3}{8}x - \frac{5}{8}$

**Section 3.1**

2. yes

4. no

6. yes

10. (3, 1)

14. (1, -5)

18. (4, -5)

22. (3, -2)

28.  $\{(x, y) | 2x - 3y = 6\}$

54.  $\frac{19}{12}$

**Section 3.1 (cont)**

38. Let  $x$  = measure of first angle;  $y$  = measure of second angle:

$x + y = 90$

$x + \frac{1}{2}y = 64$

40.  $c + a = 250$

3.5c + 7a = 1347.5

42.  $2l + 2w = 288$

$l = w + 44$

44. Let  $x$  = # two-pointers;  $y$  = # three pointers

$x + y = 40$

$2x + 3y = 89$

46. Let  $x$  = # of 30 sec. Commercials;  $y$  = # of 60 sec. commercials

$x + y = 12$

$30x + 60y = 600$

50.  $c + f = 152$

$c = 5 + 6f$

56.  $\frac{13}{3}$

66. Let  $x$  represent Burl's age now and  $y$  his son's age now.

$x = 2y$

$x - 10 = 3(y - 10)$

**Section 3.2**

6. (2, -7)

14.  $\frac{25}{23}, \frac{11}{23}$

22.  $\frac{1}{2}, -5$

24.  $\frac{10}{21}, \frac{11}{14}$

36. (2, 3)

38.  $\frac{1}{2}, \frac{1}{2}$

42. no solution

52. 86

54. 30m, 90m, 360m

**Section 3.3**

6. first angle =  $38^\circ$ ; second =  $52^\circ$

8. 115 children's; 135 adult's

10.  $l = 94$  ft.,  $w = 50$  ft.

12. 31 two-pointers and 9 three-pointers

22. cashews 20 lb; brazil nuts 30 lb

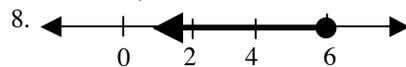
26. Deep Thought 12 lb; Oat Dream 8 lb

48.  $\frac{13}{10}$

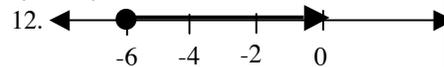
**Section 4.1**

2. -5 is a solution, -10 is a solution, 0 is not a solution, and 27 is not a solution

4. 2 is not a solution, -3 is a solution, 0 is a solution, and 3 is not a solution



$\{t | t \leq 6\}$  ;  $(-\infty, 6]$



$\{x | x \geq 6\}$  ;  $[6, \infty)$

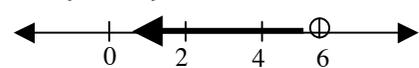
14.  $\{x | x > 3\}$  or  $(3, \infty)$



20.  $\{y | y > 6\}$  or  $(6, \infty)$



32.  $\{x | x < 6\}$  or  $(-\infty, 6)$



36.  $\{x | x > \frac{2}{3}\}$ , or  $(\frac{2}{3}, \infty)$

42.  $\{x | x > \frac{2}{17}\}$ , or  $(\frac{2}{17}, \infty)$

48.  $\{x | x > 6\}$  or  $(6, \infty)$

**Section 4.1 (cont)**

54. Calls shorter than 3.5 min.

58. More than 4.25 hr.

60. Plan B is better for values greater than  $85\frac{5}{7}$ 

62. Parties of more than 80

74.  $22x-7$ **Section 4.3**2.  $x = \square 9$  or  $x = 9$ 10.  $x = \square \frac{1}{2}$  or  $x = \frac{7}{2}$ 16.  $x=2$  or  $x=8$ 20.  $x = \square 8$  or  $x = 8$ 22.  $q = \square \frac{11}{5}$  or  $q = \frac{11}{5}$ 54.  $\{x \mid 2 < x < 4\}$  or  $(\square 2, 4)$ 

62.  $\boxed{a} \mid a \square \square \frac{3}{2} \text{ or } a \geq \frac{13}{2} \boxed{}$

$$\boxed{\square}, \square \frac{3}{2} \boxed{\square}, \frac{13}{2} \boxed{\square}$$

86.  $(-2, -3)$ 88.  $(-1, 7)$ **Section 5.1**

2. Degree of terms: 3,2,1,0; degree of poly.: 3

10.

$\square 10x^4 + 7x^2 \square 3x + 9; \square 10x^4; \square 10$

20.  $Q(3) = \square 51$  and  $Q(\square 1) = 5$ 

22. 282; -9

32. 400 ft

56.  $16x + 7y \square 5z$ 60.  $2a^2 + 3b \square 4ab + 4$ 66.  $\square \frac{2}{15}xy + \frac{19}{12}xy^2 + 1.7x^2y$ 72.  $14y + 7$ 78.  $5y^2 + 6y + 3y^3$ 92.  $x^2 \square x \square 2$ **Section 5.2**8.  $3a^3 \square 12a^2$ 12.  $8a^2 + 10ab \square 3b^2$ 14.  $m^2 \square 25$ 34.  $x^2 + 5x + 6$ 36.  $y^2 + 4y \square 5$ 40.  $4s^2 + 12st + 9t^2$ 56.  $x^2 \square 9$ 60.  $9x^2 \square 25y^2$ 62.  $16a^6 \square 25a^2b^2$ 

80.  $y = \frac{w}{x+z}$

**Section 5.3**22.  $\square 2(x^2 \square 6x \square 20)$ 30.  $\square (m^3 + m^2 \square m + 2)$ 32.  $(t \square 3)(r \square s)$ 34.  $(a+5)(2a \square 1)$  $h(t) = \square 16(t \square 6)$ 50.  $h(1) = 80 \text{ ft}$ 52.  $\square r(2h+r)$ 

64. -1

**Section 5.4**2.  $(x+1)(x+5)$ 6.  $(t \square 5)(t+3)$ 8.  $2(a \square 4)^2$ 10.  $x(x+9)(x \square 6)$ 16.  $(a \square 4)(a \square 7)$ 18.  $(x+3)(x \square 2)$ 20.  $5(y+1)(y+7)$ 38.  $(3x+2)(x \square 6)$ 44.  $(3a+2)(3a+4)$ **Section 5.5**6.  $4(a \square 2)^2$ 26.  $(y+10)(y \square 10)$ 30.  $(pq+5)(pq \square 5)$ 38.  $a^2(3a+b)(3a \square b)$ **Section 5.7**2.  $(x+12)(x \square 12)$ 4.  $(2a \square 3)(a \square 4)$ 8.  $(p+8)^2$ 10.  $2(y+11)(y \square 6)$ 12.  $(4a+9b)(4a \square 9b)$ 50.  $\square \frac{13}{7}$ **Section 5.8**2.  $t = 7$  or  $t = -4$ 8.  $y = -5$  or  $y = -3$ 12.  $x = 0$  or  $x = 9$  or  $x = \square 7$ 16.  $a = \square 6$  or  $a = 6$ 

52. 5 ft

54. The integers are -10, -8, and -6 or 6, 8, and 10

62. 9m by 12m

**Section 6.1**16.  $a+4$ 18.  $\frac{7}{2x \square 3}$ 32.  $\frac{a+4}{a \square 4}$ 40.  $\frac{3t^2}{4}$ 50.  $\frac{1 \square y}{y+4}$ 62.  $\frac{(y \square 3)(y+2)}{y^6}$ 66.  $\square x^2$ 82.  $\square 2t^4 + 11t^3 \square t^2 + 10t \square 3$ **Section 6.2**

Page 327:

2.  $\frac{4}{y}$ 8.  $\frac{2t+4}{t \square 4}$ 16.  $\frac{7}{a}$ 24.  $\frac{2a^2+22}{(a \square 5)(a+4)}$ 32.  $\frac{4y+17}{(y+2)(y \square 2)}$ 60.  $\frac{7b^{11}c^7}{9a^2}$ **Section 6.4**8.  $x=5$ 

10. no solution

16.  $x=11$ 20.  $a=2$  or  $a=3$ 22.  $t = -23$ 32.  $y = -3$ 

44. Child's: 118; adult's: 132

46. 16 and 18

**Section 6.5**8.  $\frac{45}{14}$  or  $3\frac{3}{14}$  hours10.  $8\frac{4}{7}$  hours

12. 2.475 hr

22. 8 hr

28. Simone's speed is  $\frac{16}{3}$  mph;  
Rosanna's speed is  $\frac{10}{3}$  mph

30. Train B is 58 mph and train A is 46 mph

32. 9 km / h

42.  $5x^6y^4$

44.  $\square 2x^4 \square 7x^2 + 11x$

### Section 6.8

32.  $y = \frac{5}{12}x$

38. 6 amperes

42. 40 lb

46.  $y = \frac{64}{x}$

54. 27 min

58.  $y = 15x^2$

60.  $y = \frac{0.0015}{x^2}$

66. 72 ft

76.  $8a^3 \square 2a$

78.  $\square \frac{5}{3}, \frac{7}{2}$

### Section 7.1

2. 7, -7

8. 15, -15

16. 0.6

18. 0.12

26.  $p(4) = \sqrt{12}$ ;  $p(3) = \sqrt{\square 2}$

(not real);

$p(\square 5) = \sqrt{30}$ ;  $p(0) = \sqrt{\square 20}$

(not real)

30.  $f(2) = \sqrt{\square 2}$  (not real);

$f(3) = \sqrt{17}$ ;  $f(4) = \sqrt{54}$

60.  $4x$

64.  $a + 1$

70. 3

72.  $2x$

80.  $(x \square 2)^4$

100.  $10a^{10}b^9$

102.  $\frac{x^6y^2}{25z^4}$

### Section 7.2

4. 2

6. 2

14.  $\sqrt{b^3}$

18. 81

20. 729

24.  $27y^9$

28.  $6^{\frac{1}{2}}$

30.  $a^{\frac{5}{2}}$

36.  $(x^3y^2z^2)^{\frac{1}{7}}$

64.  $8^{\frac{9}{11}}$

70.  $x^{\frac{17}{12}}$

100.  $49x^2 \square 14xy + y^2$

### Section 7.3

2.  $\sqrt{35}$

22.  $3\sqrt{3}$

24.  $3\sqrt{5}$

28.  $5\sqrt{13}$

42.  $x^3y^4\sqrt{y}$

44.  $a^2b^2c^4(\sqrt[3]{bc})$

74.  $\frac{2a + 6b^3}{a^4b^4}$

### Section 7.4

6.  $\frac{11}{x}$

36.  $\frac{2\sqrt{10}}{3}$

46.  $\frac{\sqrt{30x}}{10}$

### Section 7.5

8.  $7\sqrt{6}$

14.  $58\sqrt{3}$

26.  $4\sqrt{3} + 3$

28.  $15 \square 3\sqrt{10}$

36. -1

46.  $t \square 2\sqrt{2rt} + 2r$

### Section 7.6

2.  $x = \frac{63}{5}$

4.  $\frac{25}{3}$

6. 168

### Section 8.1

2.  $x = \pm\sqrt{5}$

6.  $x = \pm\frac{\sqrt{35}}{5}$

10.  $13 \pm 3\sqrt{2}$

18. -3, 7

78.  $4\sqrt{5}$

80. 7

### Section 8.2

2.  $x = \frac{7 \pm \sqrt{33}}{2}$

4.  $u = 1, \frac{5}{3}$

14.  $\frac{\square 1 \pm \sqrt{21}}{2}$

20.  $\frac{\square 3 \pm \sqrt{37}}{2}$

