

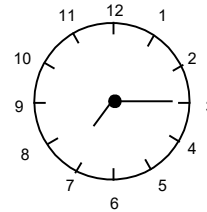
Answer Key

- | | |
|-----------|--|
| 1. 16 | 43. 3.3 |
| 2. 2 | 44. 8.45 |
| 3. 18 | 45. 8.4 |
| 4. 4 | 46. 4.2 |
| 5. 36 | 47. 6.6 |
| 6. 25 | 48. 2.6 |
| 7. 2 | 49. 4.4 |
| 8. 12 | 50. 1.6 |
| 9. 6 | 51. 5 |
| 10. 3 | 52. 29 |
| 11. 8.5 | 53. 34 |
| 12. 7.8 | 54. 29 |
| 13. 4.84 | 55. 29 |
| 14. 8.4 | 56. 13 |
| 15. 11.24 | 57. 17 |
| 16. 9.15 | 58. 14 |
| 17. 10.45 | 59. 10 |
| 18. 9.645 | 60. 32 |
| 19. 9.282 | 61. 20 |
| 20. 7.569 | 62. 23 |
| 21. 8 | 63. 13 |
| 22. 8 | 64. 11 |
| 23. 36 | 65. 29 |
| 24. 30 | 66. 13 |
| 25. 36 | 67. 29 |
| 26. 15 | 68. 26 |
| 27. 49 | 69. 34 |
| 28. 15 | 70. 21 |
| 29. 8 | 71. A=7, B=8, C=2
Ans=7 (for A) & 8 (for B) & 2 (for C) |
| 30. 14 | 72. A=3, B=6, C=9
Ans=3 (for A) & 6 (for B) & 9 (for C) |
| 31. 13 | 73. A=6, B=1, C=7
Ans=6 (for A) & 1 (for B) & 7 (for C) |
| 32. 15 | 74. A=7, B=7, C=3
Ans=7 (for A) & 7 (for B) & 3 (for C) |
| 33. 25 | 75. A=2, B=3, C=7
Ans=2 (for A) & 3 (for B) & 7 (for C) |
| 34. 10 | 76. A=5, B=9, C=5
Ans=5 (for A) & 9 (for B) & 5 (for C) |
| 35. 10 | 77. A=7, B=1, C=8
Ans=7 (for A) & 1 (for B) & 8 (for C) |
| 36. 5 | 78. A=4, B=3, C=6
Ans=4 (for A) & 3 (for B) & 6 (for C) |
| 37. 17 | |
| 38. 7 | |
| 39. 17 | |
| 40. 19 | |
| 41. 2.4 | |
| 42. 2.6 | |

MAP 225 (T3) Issue 9

79. $A=7, B=6, C=1$
 Ans=7 (for A) & 6 (for B) & 1 (for C)
80. $A=3, B=5, C=9$
 Ans=3 (for A) & 5 (for B) & 9 (for C)
81. 7
82. 5
83. 5
84. 3
85. 4
86. 12
87. 9
88. 8
89. 6
90. 9
91. 55
92. 88
93. 130
94. 119
95. 64
96. 75
97. 26
98. 133
99. 45
100. 97
101. $66 - 45 = 21$
102. $8 \times 5 = 40$
103. $4 \times 10 + 6 = 46$

104. $4 \times 60 = 240$
105. $43 - 15 = 28$
106. $24 \div 8 = 3$
107. $3 \times 20 = 60 \text{ miles}$
108. $25 - 17 = 8 \text{ (in)}$
109. $6:30 - 0:20 = 6:10$
110. $2.00 - 1.45 = \$0.55$
111. 200
112. $3 \times 5 = 15$
113. $3 \times 20 = 60$
114. 4
115. bottom: 60
 middle: 30
 top: 20
 $60 + 30 + 20 = 110 \text{ inches}$
116. $10 + 2 + 3 = 15$
117. $2 + 5 \times (5 - 1) = 22$
118. $30 \div 6 = 5$
119. $3 \times 6 + 14 = 18 + 14 = 32$
120. The time is $6:30 + 0:45 = 7:15$



Answer Key

1. 600, 60
2. 70, 7
3. 700, 70
4. 80, 8
5. 800, 80
6. 200, 2000
7. 300, 3000
8. 400, 4000
9. 500, 5000
10. 600, 6000
11. .005, .0005
12. .006, .0006
13. .007, .0007
14. .008, .0008
15. .009, .0009
16. 1000, 10000
17. 2000, 20000
18. 3000, 30000
19. 4000, 40000
20. 5000, 50000
21. 18
22. 7
23. 36
24. 16
25. 8
26. 28
27. 56
28. 8
29. 45
30. 42
31. $\frac{3}{7}$
GCF = 2
32. $\frac{9}{8}$
GCF = 6
33. $\frac{2}{5}$
GCF = 8
34. $\frac{4}{5}$
GCF = 10
35. $\frac{5}{7}$
GCF = 10
36. $\frac{7}{9}$
GCF = 10
37. $\frac{4}{9}$
GCF = 14
38. $\frac{7}{6}$
GCF = 16
39. $\frac{2}{9}$
GCF = 18
40. $\frac{5}{9}$
GCF = 18
41. 7.5
42. 5.5
43. 10.75
44. 7.75
45. 10.75
46. 9.25
47. 2.25
48. 4.75
49. 7.5
50. 3.25
51. 2 (GCF) & 30 (LCM)
52. 9 (GCF) & 54 (LCM)
53. 7 (GCF) & 252 (LCM)
54. 3 (GCF) & 18 (LCM)
55. 6 (GCF) & 120 (LCM)
56. 3 (GCF) & 108 (LCM)
57. 2 (GCF) & 40 (LCM)
58. 3 (GCF) & 63 (LCM)
59. 11 (GCF) & 66 (LCM)
60. $124 - 16 = 108$
 $108 + 124 = 232$ sec
61. $11:20 - 8:15 = 3$ hr 5 min
62. $2:25$ pm + $0:55 = 3:20$ pm
63. $1:20 + 4:10 = 5:30$ pm
64. $11:20 - 1:35 = 9:45$ am
65. $11:15 - 9:30 = 1:45$ pm
66. 4.5 hrs
67. $15 \div 4 = 3\frac{3}{4}$ hrs = 3 hr and 45 min
68. $8:45 + 8:45 = 17:30 = 5:30$ pm
69. $4 \times 12 \div 3 = 16$
70. $16 + 12 + 9 + 19 = 56$
71. $7:55 + 1:15 = 8:70$ pm = 9:10 pm
72. $2:40$ pm - $4:10 = 10:30$ am
73. 7 days
74. $3 \times 3 = 9$ (miles)
75. $10:45 - 9:07 = 1:38 = 1$ hr & 38 min
76. 10:55 am

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77. $1:15 \text{ pm} = 13:15$
 $13:15 - 11:30 = 1 \text{ hr \& } 45 \text{ min}$

78. $1:15 + 0:35 = 1:50 \text{ pm}$

79. $1:20 \text{ pm} + 4:10 = 5:30 \text{ pm}$

80. $20 - 5 - 5 = 10$
 $10 + 2 = \underline{12 \text{ colors}}$

81. $20 \div 2 = 10$
 $10 \times 4 - 4 = \underline{36}$

82. $20 \times 4 = 80$
 $80 - 3 = 77$
Ans = 20 right & 3 wrong & 2 omissions

83. $20 \div 5 = 4$
 $4 \times 16.5 = \underline{\$66.00}$

84. $200 - (50 + 40) - (30 + 20) - 10 = \boxed{50}$

85. $2003 - 1903 = 10$
 $10 + 10 + 20 = \underline{40 \text{ yrs old}}$

86. 21

87. $24 = \frac{1}{3}(2 \times \square)$
 $\square = 36$

88. $25 + 15 = 40$
 $7:40 + 0:40 = \boxed{8:20}$

89. 25%

Answer Key

- | | |
|--|-------------|
| 1. $\frac{42}{60}$
Hint: $\frac{7}{9}$ | 27. 9000 |
| 2. $\frac{1}{8}$
Hint: $\frac{1}{7}$ | 28. 40 |
| 3. $\frac{8}{10}$
Hint: $\frac{8}{9}$ | 29. 3 |
| 4. $\frac{1}{3}$
Hint: $\frac{1}{2}$ | 30. 12 |
| 5. $\frac{4}{8}$
Hint: $\frac{2}{3}$ | 31. 60 |
| 6. $\frac{32}{40}$
Hint: $\frac{8}{9}$ | 32. 80 |
| 7. $\frac{36}{28}$
Hint: $\frac{8}{7}$ | 33. 5 |
| 8. $\frac{4}{28}$
Hint: $\frac{1}{6}$ | 34. 6 |
| 9. $\frac{30}{42}$
Hint: $\frac{5}{6}$ | 35. 50 |
| 10. $\frac{12}{16}$
Hint: $\frac{6}{7}$ | 36. 8 |
| 11. 560 | 37. 3 |
| 12. 490 | 38. 4 |
| 13. 240 | 39. 0.2 |
| 14. 14 | 40. 2 |
| 15. 350 | 41. 2 |
| 16. 63 | 42. 0.03 |
| 17. 42 | 43. 0.3 |
| 18. 1.6 | 44. 0.4 |
| 19. 280 | 45. 0.6 |
| 20. 21 | 46. 2 |
| 21. 70 | 47. 9 |
| 22. 6 | 48. 0.7 |
| 23. 4000 | 49. 8 |
| 24. 1000 | 50. 0.5 |
| 25. 0.2 | 51. 0.003 |
| 26. 1.6 | 52. 0.002 |
| | 53. 0.003 |
| | 54. 0.007 |
| | 55. 0.005 |
| | 56. 0.09 |
| | 57. 0.02 |
| | 58. 0.08 |
| | 59. 0.0006 |
| | 60. 0.00004 |
| | 61. 5 |
| | 62. 0.0035 |
| | 63. 0.4 |
| | 64. 0.003 |
| | 65. 9 |
| | 66. 0.028 |

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67. 8

68. 0.001

69. 6

70. 0.0015

71. $\frac{55}{56}$
GCF = 2, LCM = 56

72. $\frac{1}{3}$
GCF = 7, LCM = 42

73. $\frac{9}{28}$
GCF = 3, LCM = 84

74. $\frac{51}{70}$
GCF = 5, LCM = 70

75. $\frac{25}{36}$
GCF = 3, LCM = 36

76. $\frac{41}{72}$
GCF = 2, LCM = 72

77. $\frac{1}{10}$
GCF = 3, LCM = 30

78. $\frac{5}{24}$
GCF = 1, LCM = 24

79. $\frac{37}{60}$
GCF = 2, LCM = 60

80. $\frac{1}{270}$
GCF = 3, LCM = 270

81. 6 in (A) & 15 in (B) & 4 in (C) & 7 in (D)

82. 4 in (A) & 11 in (B) & 4 in (C) & 7 in (D)

83. 4 in (A) & 9 in (B) & 6 in (C) & 5 in (D)

84. 8 in (A) & 7 in (B) & 3 in (C) & 5 in (D)

85. 8 in (A) & 12 in (B) & 8 in (C) & 5 in (D)

86. $160 \times 4 \times 3 = \1920

87. Considering the number of 1's used in the sum.

6×1's:	1+1+1+1+1+1
5×1's:	None
4×1's:	1+1+1+1+2
3×1's:	1+1+1+3
2×1's:	1+1+2+2 and 1+1+4
1×1:	1+2+3 and 1+5
0×1's:	2+2+2, 2+4 and 3+3

Ans = 10 different ways

88. 6 doors remaining open

1 st	1	2	3	4	5	6	7	8	9	0	1	2
2 nd	1	2	3	4	5	6	7	8	9	0	1	2
3 rd	1	2	3	4	5	6	7	8	9	0	1	2

The door is closed if its number is boldfaced. The doors remain open is 1, 5, 6, 7, 11, and 12.

89. 3

90. 10 outcomes
AB, AC, AD, AE,
BC, BD, BE,
CD, CE, and
DE.

91. $84 \times \frac{6}{6+8} = 84 \times \frac{3}{7} = 36$

92. C
 $4 \times 2 \times 1 = 8$

93. A
 $4 \times 1 + 2 + 1 + 2 = 24$
 $2 \times 1 \times 2 = 4$
 $24 + 4 = 28$

94. $10 \times 8 = 80$
 $6 \times 80 = 480$
 $1440 \div 480 = 3$ days

95. The speed of the car is $90 \div 3 = 30$ miles per hour.
a) 150 miles in 5 hours
b) 8 hours for 240 miles

96. C
 $\frac{1}{5} \times 20 = \4.00

97. D
 $20 \div \frac{5}{6} = 24$
or $20 + 4 = \$24$

98. 4.41

99. $52.50 - 50 = \$2.50$
 $2.5 \div 50 = 0.05 = 5\%$

100. $60 \times \frac{7}{5} = \84

101. $x - 1 < 5$
 $x < 6$
 $x = 5$

102. $1\frac{1}{3} = \frac{4}{3}$
 $(\frac{4}{3})^3 = \frac{64}{27} = 2 \frac{10}{27}$

103. \$36

104. $1 - 25\% = 1 - \frac{1}{4} = \frac{3}{4}$
 $80 \times \frac{3}{4} = 60$
 $60 \times 5\% = 3$
 $60 + 3 = \$63.00$

105. When the minute hand move 30° , the hourly hand moves $\frac{1}{12} \times 30 = 2.5^\circ$.
 $60 + 2.5 = 62.5^\circ$

Answer Key

- | | |
|----------------|--------------------|
| 1. 4, 40 | 43. $6 - 4x$ |
| 2. 5, 50 | 44. $-15 + 9x$ |
| 3. 6, 60 | 45. $-15 + 9x$ |
| 4. 7, 70 | 46. $9 + 27x$ |
| 5. 8, 80 | 47. $4 - 6x$ |
| 6. 9, 90 | 48. $10 - 12x$ |
| 7. .1, 1 | 49. $-6 - 27x$ |
| 8. .2, 2 | 50. $12 + 24x$ |
| 9. .3, 3 | 51. $10x - 21$ |
| 10. .4, 4 | 52. $-5x - 2$ |
| 11. 0.028 | 53. $-8x - 9$ |
| 12. 0.035 | 54. $7x - 1$ |
| 13. 0.025 | 55. $-4x + 13$ |
| 14. 0.03 | 56. $4x - 6$ |
| 15. 0.02 | 57. $x + 4$ |
| 16. 0.0036 | 58. $-10x - 6$ |
| 17. 0.01 | 59. -6 |
| 18. 0.0015 | 60. $-13x - 9$ |
| 19. 0.0024 | 61. 7 |
| 20. 0.0032 | 62. 2 |
| 21. 28 | 63. -6 |
| 22. 300 | 64. 8 |
| 23. 100 | 65. -5 |
| 24. 350 | 66. 5 |
| 25. 25 | 67. -10 |
| 26. 150 | 68. -9 |
| 27. 2.4 | 69. 3 |
| 28. 20 | 70. 8 |
| 29. 3.6 | 71. $\frac{3}{7}$ |
| 30. 32 | 72. $\frac{5}{8}$ |
| 31. 0.625 | 73. $\frac{2}{3}$ |
| 32. 0.6 | 74. $\frac{5}{6}$ |
| 33. $7/12$ | 75. $\frac{9}{8}$ |
| 34. $5/9$ | 76. $\frac{4}{3}$ |
| 35. $31/60$ | 77. $\frac{9}{5}$ |
| 36. $61/120$ | 78. $\frac{-7}{2}$ |
| 37. $71/140$ | 79. $\frac{-7}{9}$ |
| 38. $81/160$ | |
| 39. $91/180$ | |
| 40. $121/240$ | |
| 41. $3 - 6x$ | |
| 42. $-8x + 12$ | |

MAP 265 (T3) Issue 9

80. $\frac{-1}{3}$

81. $x = 5$

82. $10/7$

83. $x = -5$

84. $x = 4$

85. $x = -2$

86. $x = -15$

87. $x = 1$

88. $5a + 2 = 3a - 7$

$2a + 2 = -7$

$2a = -9$

$a = -9/2$

89. 5

90. $x = 3$

91. 5

92. 9

93. 8

94. 8

95. 3

96. 9

97. 7

98. -2

99. -6

100. -9

101. $-2x^2 + 14x - 6$

102. $-15x^2 + x - 18$

103. $4x^2 - 4x - 6$

104. $-5x^2 - 12x + 4$

105. $-2 - 2x$

106. $4 - 3x$

107. $-10x + 4$

108. $7x + 6$

109. $6x^2 - 2x + 2$

110. $-4x^2 - 4x - 4$

Answer Key

- | | |
|------------------------|--------------------|
| 1. $2(7x + 4)(8x - 7)$ | 20. 9 |
| 2. $5(x + 2)(10x - 3)$ | 21. 27 |
| 3. $3(5x + 4)(6x + 5)$ | 22. 4 |
| 4. $4(5x - 7)(7x + 4)$ | 23. 8 |
| 5. $2(x + 5)(4x - 3)$ | 24. 16 |
| 6. $x + 1$ | 25. 32 |
| $x^2 + 2x + 1 =$ | 26. 32 |
| $(x + 1)(x + 1)$ | 27. 9 |
| $x^2 + 5x + 4 =$ | 28. 27 |
| $(x + 1)(x + 4)$ | 29. 81 |
| 7. $x + 4$ | 30. 4 |
| $3x^2 + 16x + 16 =$ | 31. 8 |
| $(x + 4)(3x + 4)$ | 32. 16 |
| $x^2 + 6x + 8 =$ | 33. 32 |
| $(x + 4)(x + 2)$ | 34. 4 |
| 8. $x - 2$ | 35. 8 |
| $2x^2 - 7x + 6 =$ | 36. $\frac{3}{7}$ |
| $(x - 2)(2x - 3)$ | 37. $\frac{2}{3}$ |
| $x^2 - 4x + 4 =$ | 38. $\frac{1}{5}$ |
| $(x - 2)(x - 2)$ | 39. $\frac{3}{10}$ |
| 9. $3x + 1$ | 40. $\frac{2}{5}$ |
| $3x^2 + 4x + 1 =$ | 41. $\frac{5}{11}$ |
| $(3x + 1)(x + 1)$ | 42. $\frac{3}{11}$ |
| $12x^2 + 7x + 1 =$ | 43. $\frac{2}{7}$ |
| $(3x + 1)(4x + 1)$ | 44. $\frac{4}{11}$ |
| 10. $x + 1$ | 45. $\frac{5}{12}$ |
| $2x^2 + 3x + 1 =$ | 46. 32 |
| $(x + 1)(2x + 1)$ | 47. 4 |
| $3x^2 + 5x + 2 =$ | 48. 8 |
| $(x + 1)(3x + 2)$ | 49. 16 |
| 11. $11+4$ & $11-4$ | 50. 32 |
| Roots = 15 & 7 | 51. 9 |
| 12. $-4+3$ & $-4-3$ | 52. 27 |
| Roots = -1 & -7 | 53. 81 |
| 13. 5 & 2 | 54. 4 |
| $5+2$ & $5-2$ | 55. 8 |
| Roots = 7 & 3 | 56. $\frac{1}{8}$ |
| 14. 3 & 5 | |
| $3+5$ & $3-5$ | |
| Roots = 8 & -2 | |
| 15. -2 & 1 | |
| $-2+1$ & $-2-1$ | |
| Roots = -1 & -3 | |
| 16. 8 | |
| 17. 4 | |
| 18. 16 | |
| 19. 32 | |

57. $\frac{1}{16}$
58. $\frac{1}{16}$
59. $\frac{1}{16}$
60. $\frac{1}{16}$
61. $1\frac{9}{16}$
62. $1\frac{9}{16}$
63. $\frac{1}{16}$
64. $\frac{1}{.16}$
65. $1\frac{11}{25}$
66. $\frac{1}{3} + \frac{3}{1} = 3\frac{1}{3}$
67. $\frac{9}{7} + \frac{1}{2} = 1\frac{11}{14}$
68. $\frac{3}{1} + \frac{1}{3} = 3\frac{1}{3}$
69. $\frac{10}{7} + \frac{1}{2} + \frac{2}{3} = 2\frac{25}{42}$
70. $\frac{7}{3} + \frac{1}{3} + \frac{1}{3} = 3$
71. $\frac{5}{4} + \frac{1}{2} = 1\frac{3}{4}$
72. $\frac{5}{2} + \frac{4}{5} = 3\frac{3}{10}$
73. $\frac{2}{3} + \frac{3}{1} = 3\frac{2}{3}$
74. $\frac{7}{10} + \frac{2}{5} + \frac{3}{1} = 4\frac{1}{10}$
75. $\frac{7}{1} + \frac{2}{1} + \frac{1}{2} = 9\frac{1}{2}$
76. $2\log(x+1) = 6\log 2$
 $\log(x+1) = 3\log 2$
 $x+1 = 8$
 $x = 7$
77. $x^2 + 1 = 10(x+2)$
 $x^2 - 10x = 19$
 $x^2 - 10x + 25 = 44$
 $(x-5)^2 = (2\sqrt{11})^2$
 $x = 5 + 2\sqrt{11}$ (negative root ruled out)
78. $(x+1)(3x-5) = 4(5x-3)$
 $3x^2 - 2x - 5 = 20x - 12$
 $3x^2 - 22x + 7 = 0$
 $(3x-1)(x-7) = 0$
 $x = 7$ (1/3 invalid)
79. $\log 10^{x-2} = \log 5^x$
 $(x-2) = x\log 5$
 $x(1-\log 5) = 2$
 $x = 2/\log 2$
80. $(x+1)\log 2 = (1-2x)\log 5$
 $(\log 2 + 2\log 5)x = \log 5 - \log 2$
 $x = \frac{\log 2.5}{\log 50}$
81. $x^2 = \log_3 10$
 $x = \pm\sqrt{\log_3 10}$
82. $|3^{x^2} - 10| = 1$
 $3^{x^2} - 10 = \pm 1$
 $3^{x^2} = 10 \pm 1$
 $3^{x^2} = 9$ or 11
Case 1:
 $x^2 = \log_3 9 = 2$
 $x = \pm\sqrt{2}$
Case 2:
 $3^{x^2} = 11$
 $x^2 = \log_3 11$
 $x = \pm\sqrt{\log_3 11}$
83. $3^{|x^2-4|} = 27$
 $|x^2-4| = \log_3 27 = 3$
 $x^2 - 4 = \pm 3$
 $x^2 = 4 \pm 3 = 7$ or 1
 $x = \pm\sqrt{7}$ or ± 1
84. $\log_8(x+1) - \log_8 x = 2$
 $\log_8 \frac{x+1}{x} = 2$
 $\frac{x+1}{x} = 64$
 $x+1 = 64x$
 $x = 1/63$
85. $\log \frac{x}{x+3} = -1$
 $\frac{x}{x+3} = \frac{1}{10}$
 $10x = x+3$
 $9x = 3$
 $x = \frac{1}{3}$
86. $\log \frac{2x+1}{x-2} = 1$
 $\frac{2x+1}{x-2} = 10$
 $2x-1 = 10(x-2)$
 $8x = 19$
 $x = 19/8$
87. 10 or 100
Since
 $x^{\log x} = \frac{x^3}{100}$
Apply log to both sides; we have
 $(\log x)^2 = 3\log x - 2$
Let $t = \log x$
 $t^2 = 3t - 2$
 $t^2 - 3t + 2 = 0$
 $(t-1)(t-2) = 0$
 $t = 1$ or 2
Case $t = 1$:
 $\log x = 1$
 $x = 10$
Case $t = 2$:
 $\log x = 2$
 $x = 100$