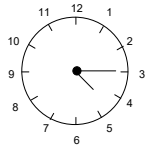
Answer Key

1. N/A
2. N/A
3. N/A
4. N/A
5. N/A
6. N/A
7. N/A
8. N/A
9. N/A
10. N/A
11. 9
12. 12
13. 130
14. 12
15. 63
16. 8
17. 4
18. 39
19. 93
20. 120
21. 13.4
22. 9.5
23. 8.7
24. 10.8
25. 1.6
26. 4.4
27. 2.5
28. 7.7
29. 14.8
30. 8.9
31. 6.3
32. 6
33. 10.1
34. 16.3
35. 6.2
36. 15.85
37. 2.28
38. 9.41
39. 12.83
40. 4.03
41. 28
42. 11
43. 14
44. 8
45. 12
46. 9
47. 15
48. 14
49. 28
50. 23
51. 5
52. 9
53. 12
54. 32
55. 6
56. 7
57. 16
58. 5
59. 5
60. 11
61. A=8, B=4
62. A=0, B=4
63. 21
64. 21
65. 22
66. A=4, B=6
67. A=6, B=9
68. A=9, B=1
69. A=1, B=5
70. A=9, B=4
71. 5 – 4.28 = $0.72
72. 50 + 20 + 1 = 71
    Not enough
73. 3×4 = 12
74. 18 cat's-eye marbles
75. 14 + 13 + 10 = 37
76. 11×9 = 99
77. 7 × 4 = 28
78. 100÷5 = 20
79. 3×8 = $24
80. 24×5 =120 (people) in the picture.
81. 10 + 13 + 7 = 30
82. 234 - 134 = 100

83. The time is 3:30 + 0:45 = 4:15 pm



84. 150÷5 = 30

85. 85 + 115 = 200
    3×200 = 600 ft

86. 12 seashells

87. 21 ÷3 = 7
    21 - 7 = 14

88. 9 years old
    9 + 11 = 20

89. 6+1 = 7
    42÷7 = 6

90. 35 + 15 = 50
    3×50 = 150 min

Answer Key

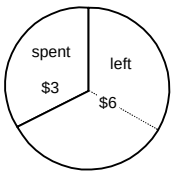
1. 0.05
2. 0.1
3. 0.15
4. 0.2
5. 0.25
6. 0.3
7. 0.35
8. 0.4
9. 0.45
10. 0.5
11. $\frac{1}{3} = \frac{a}{6} = \frac{4}{b}$

    3×2 = 6, so 1×2 = <u>2 = *a*</u>

    1×4 = 4, so 3×4 = <u>12 = *b*</u>
12. $\frac{3}{4} = \frac{a}{8} = \frac{18}{b}$

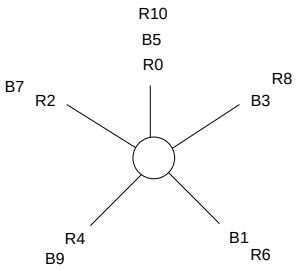
    4×2 = 8, so 3×2 = <u>6 = *a*</u>

    3×6 = 18, so 4×6 = <u>24 = *b*</u>
13. 6 (for a) & 28 (for b)
14. 15 (for a) & 35 (for b)
15. 18 (for a) & 28 (for b)
16. 30
17. 3
18. 192
19. 10
20. 36
21. 21
22. 14
23. 22
24. 10
25. 19
26. 16
27. 43
28. 65
29. 26
30. 66
31. 330
32. 529
33. 704
34. 759
35. 1035
36. 1.5
37. 3.25
38. 2.75
39. 2.2
40. 5.4
41. 7
42. 18
43. 13
44. 4
45. 6
46. 10
47. 785 + 647 + 808 = <u>$2240</u>
48. 12 - 5 = 7
49. 20 - 15 = $5
50. $6 ÷ 2 = $3



51. 6 + 3 = $9
52. 12×4 = 48
53. 10 × 9 = 90
54. 16 + 32 = 48
55. 21×2 = <u>42 cups</u>
56. 200 ÷ 5 = 40
57. 500÷10 = 50
58. 21÷3 = 7 times
59. 12 (There are 12 edges.)
60. 6 (There are 6 faces.)
61. 1
62. 80 ÷ 2 = 40
    40 - 10 = 30 in (length)
63. The area = length × width = 10×30 = 300 in^2
64. 240÷12 = 20 in
65. 2(20 + 12) = 64 in
66. 9 + 3×6 - 2×2 = <u>23 cm</u>

67. Ans = 10



1	2	3	4	5
R		B		R
	B		R	
B		R		B
	R		B	
R				

68. ①OARGONKA
②KARGONOA
③KANGOROA
KANGAROO
Ans = 3 moves

69. $3m + 4p + 2o = 7p$
$3m + 2o = 3p$ ①
$2m + 3o + 3p = 8o$
$2m + 3p = 5o$ ②
① + ②
$5m = 3o$
Ans = 3

70. Mara wakes up at 10 am at California time.
Bertie goes to bed at 10 pm at California time.
Both of them are awake from 10 am to 10 pm at California time.
Ans = 12 hours

71. 4 girls & 3 boys

72. 12+4+6+…+100
- (11+3+5+…+99)
= 1 + 1 + 1 + … + 1
= 45

Answer Key

1. 0.55
2. 0.6
3. 0.65
4. 0.7
5. 0.75
6. 44/100 = 11/25
7. 48/100 = 12/25
8. 52/100 = 13/25
9. 56/100 = 14/25
10. 60/100 = 3/5
11. 105/100 = 105%
12. 110/100 = 110%
13. 115/100 = 115%
14. 120/100 = 120%
15. 125/100 = 125%
16. 4
    40
    4
    40
17. 5
    50
    5
    500
18. 8
    80
    8
    80
19. 9
    90
    9
    900
20. 2
    20
    2
    200
21. 0.027
22. 0.012
23. 0.02
24. 0.27
25. 0.0012
26. 0.027
27. 0.002
28. 0.0008
29. 0.016
30. 0.16
31. 9
32. 14
33. 4
34. 30
35. 10
36. 13
37. 5
38. 7
39. 26
40. 4
41. 2␣2/3
42. 3␣8/9
43. 9/35
44. 1/3
45. 2␣6/7
46. 3␣1/8
47. 1/3
48. 1␣3/8
49. 1␣1/9
50. 9/14
51. 121
52. 144
53. 169
54. 1/16
55. .008
56. 0.0016
57. 0.00032
58. 0.000064
59. 1/64
60. 1/256
61. 5/36
    LCD = 36
62. 11/36
    LCD = 36
63. 5/48
    LCD = 48
64. 15/56
    LCD = 56
65. 5/12
    LCD = 12
66. 7/20
    LCD = 20

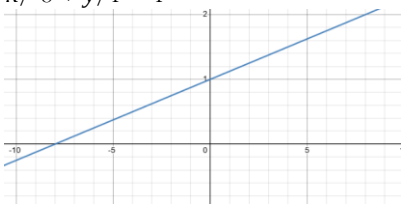
67. 1/36
    LCD = 36
68. 1/144
    LCD = 144
69. 1/35(=2/70)
    LCD = 70
70. 1/8(=3/24)
    LCD = 24
71. B
    Dan, Chris, Jim, Tim, Robert.
72. $\frac{2}{6} = \frac{1}{3} = 1/3$
73. $\frac{1}{4} = 1/4$
74. 75%×52 = 39
75. 3×5 = 15
76. 3×4 = 12
77. There are 4 possible outcomes: (H, H), (H, T), (T, H) and (T, T).
78. (H, H), (H, T), and (T, H).
79. 5×4 = 20
80. 3×2 = <u>6 ways</u>
    To scramble the work "map" as map, mpa, amp, apm, pam, pma.
81. 10 matches needed
    RY, RG, RB, RW,
    YG, YB, YW,
    GB, GW, and
    BW.
82. D
    5×0.5 = 2.5
    50÷2.5 = 20
83. 42.15÷3 = 14.05
    14.05×5 = $70.25
84. 50÷(2 + 3) = 10
    10×2×40 = 800 times
85. $1\frac{1}{4}:2\frac{1}{2}$ = 1:2
    3×2 = 6 cups
86. Julio =15
    Erin = 30
    Kesha = 37
    Total = 82
87. (a) 47 - 3 - 14 - 1 - 14 = 15
    (b) 97 - 47 = 50 B.C.
88. 6849 - 6750 = 99
89. 10×10×10×10 = 10,000
90. 25

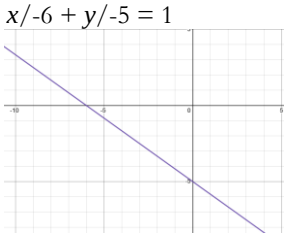
Answer Key

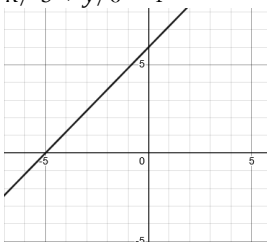
1. 6
2. -6
3. -2
4. -6
5. -32
6. 5
7. -7
8. 6
9. -30
10. 5
11. -6
12. -2
13. -1
14. -4
15. 4
16. 8
17. -6
18. 1
19. 5
20. -7
21. 16
22. 50
23. 15
24. 6
25. 8
26. 10
27. 45
28. 20
29. 16
30. 6
31. 40
32. 40
33. 100
34. 126
35. 78
36. 23
37. 19
38. 30
39. 12
40. 48
41. 18
42. 60
43. 17
44. 96
45. 48
46. 72
47. 115
48. 38
49. 32
50. 22
51. $2\sqrt{3}$
52. $3\sqrt{2}$
53. $2\sqrt{22}$
54. $16\sqrt{2}$
55. $9\sqrt{7}$
56. 18
57. 108
58. 200
59. 396
60. 1200
61. 289
62. 10000
63. 49
64. 0.49
65. 1
66. $2\frac{2}{3} = 2\ 2/3$
67. $(\frac{8}{3})^2 = 7\frac{1}{9} = 7\ 1/9$
68. $2^3 = 8$
69. $\frac{1}{36} = 1/36$
70. $(\frac{9}{8})^2 = 1\frac{17}{64} = 1\ 17/64$
71. 900
72. 16/25
73. 8/125
74. 32
75. 1/64
76. 64
77. 25
78. 625
79. 32
80. 128
81. $80\% = \frac{4}{5} = \frac{12}{x}$
    $x = 3\times5 = 15$

82. 1 + 50% = 1.5
    20×1.5×12 = $360
83. 31.50 – 30 = $1.50 (tax)
    $\frac{tax}{price}=\frac{1.5}{30}$ = 0.05 = 5%
84. 60×5%=60×0.05 = 6×5
    = $3.00
85. 60 + 3 = $63.00
    or
    1 + 5% = 1.05
    60×1.05 = $63
86. 25%×$600 = $150
87. 600 + 150 = $750.00
88. 1 – 70% = 30%
    80×30% = 80×0.3 = $24.00
89. 1 - 20% = 0.8
    30×.8 = $24.00
90. 40×0.75 = $30.00
91. $\frac{discount}{price}=\frac{10}{40}=\frac{1}{4}$ = 25%
92. 20%
93. Alex + Brian = 0.4×20 + 0.3×30 = 8 + 9 = $17
94. (60 - 48)÷60 = 0.2 = 20%
95. 1 - 25% = 1 - $\frac{1}{4}=\frac{3}{4}$
    $80\times\frac{3}{4}$ = 60
    60×5% = 3
    60 + 3 = $63.00
96. 1 + 50% = 1.5
    5×1.5 = $7.50
97. $\frac{50-32}{50}=\frac{18}{50}$ = 36%
98. $\frac{1}{2}$×0.4 = 0.2
    0.2×1.5 = 0.3
    0.3×(1 - 0.5) = 0.3×0.5 = 0.15

Answer Key

1. a) 1/8
   b) 1
   c) $y = (1/8)x + 1$
   d) $x/-8 + y/1 = 1$
   e)


2. a) -5/6
   b) -5
   c) $y = (-5/6)x + -5$
   d) $x/-6 + y/-5 = 1$
   e)


3. a) 6/5
   b) 6
   c) $y = (6/5)x + 6$
   d) $x/-5 + y/6 = 1$
   e)


4. a) 7/5
   b) 7
   c) $y = (7/5)x + 7$
   d) $x/-5 + y/7 = 1$
   e)

5. a) -8/3
   b) -8
   c) $y = (-8/3)x + -8$
   d) $x/-3 + y/-8 = 1$
   e)

6. Step I:
   Find the slope of AB first,
   The slope $m = \frac{5-(\ )}{-4-(\ )} = \frac{5-(-2)}{-4-(1)} = \frac{7}{-5}$
   Step II:
   Write the slope intercept form as
   $y = mx + b$
   Since the slope is $\frac{7}{-5}$, the equation is
   $y = \frac{7}{-5}x + b$
   Step III:
   Solve for b
   Since the line passes through A or B, either point will be fine to plug in. Let's, say, use point A(1, –2). We have
   $(-2) = \frac{7}{-5}(1) + b$
   $b = -2 + \frac{7}{5} = -\frac{3}{5}$
   Step IV:
   Finalize the equation.
   $y = \frac{7}{-5}x - \frac{3}{5}$
   Step V: Double–check with the other point B(–4, 5), which should satisfy the linear equation. Is (5) equal to $\frac{7}{-5}(-4) - \frac{3}{5}$?

   $\frac{7}{-5}(-4) - \frac{3}{5} = \frac{28-3}{5} = 5$

7. $b = 0$
8. $b = 7$
9. $b = -31$
10. No since
    $3(5) \neq 4(-4) + 4$
11. 2
12. $y = 2x + b$
13. $b = 7$ (Use point A)
14. $y = 2x + 7$
15. $2(2) + 7 = 11$ (Check for point B)
16. (3/2, 1/4)
17. (1/2, 1/2)
18. (6/5, 7/5)
19. (8/7, 1/7)
20. (2/9, 2/9)
21. -40, 400
22. 1.4, 0.49
23. $(2x - 1)^2$
24. $(3x + 3)^2$
25. 49, $(4x - 7)^2$

26. .2, –2, 23
27. 32, 80, 27
28. 1, 1.8, 17
29. 27, –36, 14
30. 75, –90, 6
31. 12, 108, 20
32. 36, –72, 26
33. 20, –20, 19
34. 8, –48, 4
35. 1.6, 8, 25
36. $2\sqrt{21}$
37. $2\sqrt{30}$
38. $5\sqrt{6}$
39. $11\sqrt{3}$
40. $30\sqrt{6}$
41. 0.6
42. 0.2401
43. 0.6
44. 0.7
45. 0.6561
46. 0.9
47. 0.81
48. 0.9
49. 3
50. 1.331
51. 30
52. 143
53. 170
54. $2\sqrt{10}$
55. $3.5\sqrt{13}$
56. $6\sqrt{17}$
57. $11\sqrt{2}$
58. $10\sqrt{26}$
59. $2\sqrt{34}$
60. $3.5\sqrt{41}$
61. Method I)
    1×45 = 45 mi (distance)
    50 - 45 = 5 mph (faster)
    $\frac{45}{50-45} = \frac{45}{5}$ = 9 (hr)

    Method II)
    Let x = time in hours for Monica to overtake Sandy, so the distance she travels is the same as the distance Sandy travels.
    $50x = 45x + 45$
    $5x = 45$
    $x = 9$
62. Method I)
    Let x be the speed of the second car, then we have
    $5\frac{1}{3}x = (5\frac{1}{3} + 2)\cdot 40$
    $\frac{16}{3}x = \frac{22}{3}\cdot 40$
    $16x = 22\cdot 40$
    $x = 11\cdot 5 = 55$ mph

    Method II)
    The second car is 40×2 = 80 miles behind when it starts. The second car must travel faster than the first car in order to catch it up. Since 5 hr and 20 min = $5\frac{1}{3}$ hr, it must travel at a speed of $80\div(5\frac{1}{3})$ = 15 miles per hour faster than the first car. Therefore, its speed is 40+15 = 55 miles per hour.
63. $2\times\frac{1}{2}$ = 1 mi (distance)
    $1\frac{1}{2} = \frac{3}{2}$ mile per hour faster
    $1\div\frac{3}{2} = \frac{2}{3}$ hr = 40 min
64. $\frac{3}{4}$:150 = $\frac{1}{4}$:50 = $\frac{1}{2}$ in:100
65. $\frac{3\frac{1}{2}}{1\frac{1}{5}}\times 60 = \frac{3.5}{1.2}\times 60 = 3.5\times 50 = 175$ mi
66. $\frac{1}{9}\times\frac{1}{9} = \frac{1}{81}$
67. Method I)
    (a) Let x hrs be the time for Michelle's trip. Thus, x + 0.5 hrs would be the time for Karen's trip. Since the difference of the trip is 10 miles, we have
    $15(x + 0.5) = 14x + 10$
    x = <u>2.5 hrs (Michelle)</u>
    2.5 + 0.5 = <u>3 hrs (Karen)</u>

    (b)
    2.5×14 = <u>35 miles (Michelle)</u>
    35 + 10 = <u>45 miles (Karen)</u>

    Method II)
    Let x be the distance rode by Michelle and x + 10 be the distance rode by Karen. Note that 30 min = **$\frac{1}{2}$ hour**. We have the following
    $\frac{x+10}{15} - \frac{x}{14} = \frac{1}{2}$ (both multiplied by 210)
    $14(x + 10) - 15x = 105$
    $14x + 140 - 15x = 105$
    $x = 35$
    Michelle rode 35 miles and Karen rode 45 miles.
68. AB = BC = 8×2 = 16
    AD = 3×AB = $\boxed{48}$
69. There are four such single-digit numbers: 2, 4, 6, and 8 since
    $2^4 = 16$
    $4^2 = 16$
    $6^1 = 6$
    $8^4 = 4096$

70. Let Joseph's and Emilio's hourly rates be x and y dollars.
$4x + 5y = 25.3$ … ❶
$5x + 6y = 31$ … ❷
❷ - ❶:
$x + y = 5.7$
$4x + 4y = 22.8$ … ❸
❶ - ❸ :
y = \$2.50 (Emilio's)
Subtract it from ❷:
x = \$3.20 (Joseph's)

71. $7\times\frac{6}{7-5}$= 21 (Mary)
$5\times\frac{6}{7-5}$= 15 (Nancy)

72. $\frac{2}{2+3}=\frac{2}{5}$
$\frac{2}{5}\times 20$ = \$8.00

73. Let's list all the events on an event table.

		the first die					
		1	2	3	4	5	6
the second die	1	2	3	4	5	6	7
	2	3	4	5	6	7	8
	3	4	5	6	7	8	9
	4	5	6	7	8	9	10
	5	6	7	8	9	10	11
	6	7	8	9	10	11	12

The events of a sum = 10 are shaded in the above table. Therefore, the probability of throwing a sum of 10 is $\frac{3}{36}=\frac{1}{12}$.

74. 2.5 + 4 + 1.5 = 8
$\frac{4}{8}=\frac{1}{2}=$ 50%

75. $12\times\frac{16}{3}$ = 4×16 = 64 bottles

76. $\frac{5000-4000}{4000}=\frac{1}{4}$ = 25%

77. 182 + 14 = 196
4×44 = 176 (not enough space)
5×44 = 220 (enough).
5×60 = 300
182×5+14×9 = 1036
300+1036 = \$1336

78. Let x students and (120 - x) adults visit the museum.
$5x + 9(120 - x) = 760$
$1080 - 4x = 760$
$320 = 4x$
x = 80 (students)
120 - x = 40 (adults)

79. 18

80. $324\times\frac{1}{1+2+3}=324\times\frac{1}{6}$ = \$54 (Chad)
$324\times\frac{2}{1+2+3}$ = 54×2 = \$108 (Bruce)
$324\times\frac{3}{1+2+3}$ = 54×3 = \$162 (Alice)