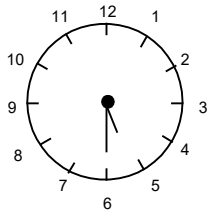
Answer Key

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. 8
12. 60
13. 6
14. 120
15. 6
16. 80
17. 8
18. 60
19. 3
20. 15
21. 4.1
22. 1.1
23. 3.3
24. 5.8
25. 4.6
26. 3.1
27. 9.7
28. 9.2
29. 6
30. 1
31. 16
32. 13
33. 30
34. 19
35. 18
36. 24
37. 29
38. 13
39. 15
40. 18
41. A=1, B=4, C=5
    Ans=1 (for A) & 4 (for B) & 5 (for C)
42. A=6, B=2, C=6
    Ans=6 (for A) & 2 (for B) & 6 (for C)
43. A=3, B=3, C=2
    Ans=3 (for A) & 3 (for B) & 2 (for C)
44. A=1, B=7, C=2
    Ans=1 (for A) & 7 (for B) & 2 (for C)
45. A=6, B=2, C=9
    Ans=6 (for A) & 2 (for B) & 9 (for C)
46. A=8, B=5, C=6
    Ans=8 (for A) & 5 (for B) & 6 (for C)
47. A=2, B=7, C=9
    Ans=2 (for A) & 7 (for B) & 9 (for C)
48. A=5, B=5, C=2
    Ans=5 (for A) & 5 (for B) & 2 (for C)
49. A=3, B=6, C=7
    Ans=3 (for A) & 6 (for B) & 7 (for C)
50. A=1, B=5, C=0
    Ans=1 (for A) & 5 (for B) & 0 (for C)
51. 2
52. 7
53. 8
54. 4
55. 5
56. 6
57. 7
58. 6
59. 8
60. 9
61. 40
62. 24
63. 50
64. 64
65. 31
66. 15
67. 199
68. 69
69. 139
70. 30
71. $6 \times 30 = 180$
72. $20 \times 5 = 100$
73. (a) $3 \times 3 = 9$
    (b) $15 \div 3 = 5$
74. $5 + 5 = 10$
    Ans = 5
75. $25 + 19 = 44$
76. $6 \times 50 = 300$

77. The time is 4:45 + 0:45 = 5:30.



78. 15÷3 = 5
79. 32÷4 = 8
80. 9 + 20 + 30 = 59
81. 3
82. 1 + 4 × (6 - 1) = 21
83. 6÷4 = 1.5 = 1 min & 30 sec
84. 25 - 8 = 17
    17 - 8 = 9
85. 5 + 3(3) = $14
86. 24÷4 = 6
87. 42 + 57 + 21 = 120
88. 6 years old
89. 10 years old
90. 7 years old

Answer Key

1. 6
2. 78
3. 6
4. 72
5. 4
6. 124
7. 3
8. 87
9. 15
10. 85
11. 6
12. 102
13. 18
14. 114
15. 3
16. 84
17. 6
18. 87
19. 25
20. 115
21. 2 (GCF) & 42 (LCM)
22. 5 (GCF) & 30 (LCM)
23. 5 (GCF) & 70 (LCM)
24. 5 (GCF) & 140 (LCM)
25. 6 (GCF) & 120 (LCM)
26. 4 (GCF) & 48 (LCM)
27. 6 (GCF) & 84 (LCM)
28. 7 (GCF) & 84 (LCM)
29. 5 (GCF) & 100 (LCM)
30. 9 (GCF) & 54 (LCM)
31. 0.04
32. 0.08
33. 0.12
34. 0.16
35. 0.2
36. 0.24
37. 0.28
38. 0.32
39. 0.36
40. 0.4
41. 55/100 = 11/20
42. 60/100 = 3/5
43. 65/100 = 13/20
44. 70/100 = 7/10
45. 75/100 = 3/4
46. 2 (GCF) & 42 (LCM)
47. 5 (GCF) & 30 (LCM)
48. 5 (GCF) & 70 (LCM)
49. 5 (GCF) & 140 (LCM)
50. 6 (GCF) & 120 (LCM)
51. 4 (GCF) & 48 (LCM)
52. 6 (GCF) & 84 (LCM)
53. 7 (GCF) & 84 (LCM)
54. 5 (GCF) & 100 (LCM)
55. 9 (GCF) & 54 (LCM)
56. 7×2 = 14, 14 + 1 = 15, so $7\frac{1}{2} = \frac{15}{2}$
57. 16 ÷ 3 = 5 R 1, so $\frac{16}{3} = 5\frac{1}{3}$
58. $1 = \frac{6}{6}$ ☐ = 6
59. $2 = 1\frac{5}{5}$ ☐ = 5
60. $6 = 4\frac{6}{3}$ ☐ = 6
61. 72
62. 25
63. 900
64. 9.6
65. 3150
66. 39
67. 28
68. 19
69. 24
70. 57
71. 52
72. 39
73. 26
74. 79
75. 53
76. 918
77. 945
78. 928
79. 1512
80. 1665
81. 918
82. 945

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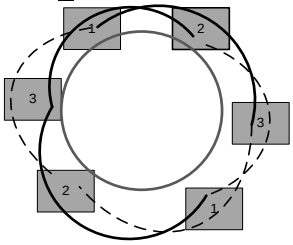
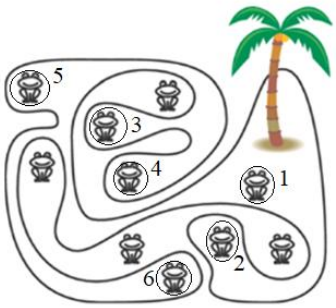
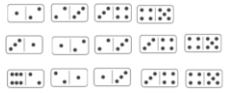
83. 928
84. 1512
85. 1665
86. 6
87. 78
88. 6
89. 72
90. 4
91. 6×3 = 18
92. 12÷6 = 2
93. 20÷6 = 3 R 2
    3 + 1 = 4
94. 32 + 27 = 59
95. 6 + 44 = 50 (lb)
96. 19 + 47 = 66
97. 140 - 104 = 36
98. 43 – 25 = 18
    25 – 18 = 7
99. 20÷5 = 4
100. 4×240 = 960 lb
101. 4×45 = 180 kg
102. 60×10×2 = 1200
103. 125×4 = 500
104. 40÷5 = 8
105. 18÷3 = 6
    6 + 5 = 11
    11 + 5 = 16
106. 202÷10 = 20 R2
    Ans = 20
107. 1+2+3
    = 2+3+1
    = 3+1+2
    = 1+2+3
    = 2 + 3 + 1
    = 3+1+2
    Ans = 6 numbers at least



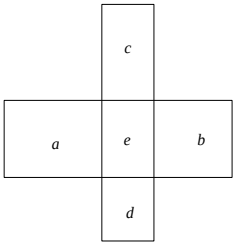
108. 6



109. 45
110. 5



111. C: ☐ + ☐ + ☐
    N: ☐
    19 – 3 = 16 = 2☐
    ☐ = 8
    4☐ = 32
112. Consonants: K | N | G | R
    Vowels: A | O
    4×2 = 8
113. Backward method:
    ③ 0 + 3 = 3
    ② 3 + 2 = 5
    ① 5 – 3 = 2 (people)
114. A = 3 S ≤ 5
    I ≤ 2 T < S
    A ≠ I T ≠ S
    Ans = 2 (at most recipes)
115. 3 + 2 + 1 = 6
    2×6 – 1 = 11
    a, b, e, ae, be, abe
    c, d, e, ce, ed, ced



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Answer Key

1. 8 (=1×2×4)
2. 33 (=1×3×11)
3. 72 (=1×4×18)
4. 48 (=2×3×8)
5. 480 (=3×4×40)
6. 50 (=2×5×5)
7. 240 (=4×5×12)
8. 1800 (=5×6×60)
9. 189 (=3×7×9)
10. 1400 (=4×7×50)
11. 252 (=6×7×6)
12. 480 (=3×8×20)
13. 168 (=7×8×3)
14. 180 (=2×9×10)
15. 540 (=4×9×15)
16. $\frac{13}{24}$
    GCF=4, LCM=24
17. $\frac{103}{550}$
    GCF=5, LCM=550
18. $\frac{19}{75}$
    GCF=10, LCM=150
19. $\frac{53}{112}$
    GCF=4, LCM=112
20. $\frac{25}{24}$
    GCF=1, LCM=24
21. $\frac{1}{84}$
    GCF=2, LCM=84
22. $\frac{1}{21}$
    GCF=1, LCM=21
23. $\frac{19}{150}$
    GCF=5, LCM=150
24. $\frac{13}{216}$
    GCF=3, LCM=216
25. $\frac{19}{189}$
    GCF=3, LCM=189
26. 10 in (A) & 4 in (B) & 3 in (C) & 1 in (D)
27. 4 in (A) & 3 in (B) & 2 in (C) & 5 in (D)
28. 3 in (A) & 5 in (B) & 3 in (C) & 4 in (D)
29. 4 in (A) & 2 in (B) & 2 in (C) & 7 in (D)
30. 3 in (A) & 4 in (B) & 3 in (C) & 2 in (D)
31. 6
    60
    6
    600
32. 9
    90
    9
    900
33. 4
    40
    4
    40
34. 6
    60
    6
    60
35. 8
    80
    8
    800
36. 144
37. 1.44
38. 169
39. 1.69
40. 225
41. 2.25
42. 256
43. 2.56
44. 289
45. 2.89
46. 141÷3 = 47
    47 + 11 = <u>58</u>
47. Owen = 10
    Steve = $\frac{1}{2}$×10 = 5
    Lyndon = 3×5 + 2 = 17
48. parakeet = 4
    canary = 2
    goldfish = 2
    turtle = 5
    Total = 4 + 2 + 2 + 5 = 13
49. 19 - 3 = 16
    16÷2 = 8
50. 10×3 = 30
    30÷2 = 15
    15 + 10 = 25
51. 18 - 12 = 6
    6÷$\frac{1}{4}$ = 6×4 = 24

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MAP 250 (T2) Issue 12

52. (a) C
(b) Total sales = 341 – 25 = <u>316</u>

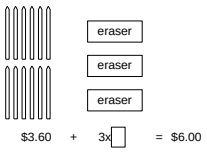
		#sold
Mon	341 – 312	29
Tue	312 – 263	49
Wed	263 – 123	140
Thu	123 - 25	98
Total	341 – 25	316

53. D
Burly, Hefty, Brutus, Stocky
Use the decision table below.

	Burly	Hefty	Brutus	Stocky
Running Back	x	**o**	x	x
Receiver	**o**		x	x
Tight End			**o**	
Quarterback			x	**o**

54. Name Length
Timmy 18
Jamie 9
George <u>21</u>
Ricardo 18
Ans = 18 (Timmy)& 9 (Jamie)& <u>21</u> (George)& 18 (Ricardo)

55. 0.3×12 = 3.6
6 - 3.60 = 2.4
2.40 ÷ 3 = <u>$0.80</u>



56. 9 jumbo cars
(24 tiny cars)

Tiny (4-seat)	Jumbo (6-seat)	#seats
24	0	96
23	1	98
22	2	100
21	3	102
20	4	104
19	5	106
18	6	108
17	7	110
16	8	112
15	**9**	**114**

57. (31 + 11)÷2 = 21
(31 – 11) ÷ 2 = 10
21×10 = <u>210</u>

58. 10 & 15 & 20

59. 12 C & 15 D & 18 E

60. (a) 2÷2 = 1
1.5 - 1 = $0.50 (pencil)
(b) 1.5 + 1 = $2.50 (eraser)

61. 60×(1 - 0.3) = 60×0.7 = $42

62. D

63. C

64. 3×5 = 15 mi

65. $16\frac{1}{8} - 1\frac{3}{4} = 14\frac{3}{8}$
$14\frac{3}{8} \div 7 = 2\frac{3}{56}$ = 2 3/56

66. Method I)
Let x be the number of students.
$4x + 10 = 5(x - 2) - 10$
$4x + 10 = 5x - 20$
$x = 30$
Method II)
2×4 + 10 = 18 (leftover books if 2 students take none)
18×(5 - 4) + 10 = 28 (number of students who take 5 books)
28 + 2 = 30 (total number of students)

67. 2×20 = 40 ft per minute
1000 yd = 3000 ft
3000÷40 = 75 min = $1\frac{1}{4}$ = 1 1/4 hr

68. LCM(4, 6) = 12

69. $T = D/S$ = 300/50 = 6 (hr)

70. 191×2 + 1 = 382 + 1= 383

71. .00005

72. $\frac{180}{45} \times (4 + 3.5)$ = 30 hrs

73. $\frac{7}{16}$ = 7/16

74. $15 \div (3^2 - 2^2) = 3$
5 + 3 = 8
8÷2 = 4

75. 300-60 = 240
240÷5 = $48.00

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Answer Key

1. -20
2. -7
3. -14
4. -12
5. -12
6. -6
7. -2
8. -7
9. -4
10. -5
11. $7x - 7$
12. $-5x - 9$
13. $4x - 2$
14. $-2x + 6$
15. $10x - 21$
16. $-6x + 2$
17. $-18x - 9$
18. $4x + 2$
19. $-4x + 20$
20. $38x + 11$
21. 72
22. -5
23. 80
24. -18
25. 42
26. 4
27. -12
28. 33
29. 2
30. 20
31. 8
32. 1/2
33. 8
34. 9
35. 4
36. 1/1024
37. 2
38. 1/2
39. 1/2
40. 8
41. 25
42. 8
43. 1/16
44. 2
45. 2/3
46. 16/625
47. 4/5
48. -2
49. 10000
50. 5
51. -2
52. 5/2
53. 2
54. 1/2
55. 8000
56. 64000
57. -1
58. 121/100
59. 2
60. -1
61. (a) 1/5 (b) 2/5 (c) 3/5 (d) 4/5
62. B
63. A
64. $\frac{1}{4}$ = 25%
65. 52.50 - 50 = \$2.50
66. 2.50 ÷ 50 = 5%
67. 200×10% = \$20.00 (tax)
    200 + 20 = \$220.00 (after tax)
68. 60 + 3 = \$63.00
69. (127.20 - 120)÷120 = 0.06 = 6%
70. tax rate = $\frac{tax}{price}=\frac{1500}{75000}$= 0.02 = 2%
71. 50×5% = 50×.05 = \$2.50
72. 30÷5% = 30 ÷ 0.05 = 3000 ÷ 5 = \$600
73. 400×15% = 400×0.15 = 4×15 = \$60
74. 20% = 0.2
    3750×0.2 = \$750.00
75. 30÷5% = 30÷0.05 = 3000÷5 = 600
76. D
    Chapter A: 75% = $\frac{3}{4}=\frac{24}{36}$
    Chapter B: $\frac{7}{9}=\frac{28}{36}$
    Chapter C: $\frac{31}{36}$
77. $\frac{tax}{cost\ without\ tax}=\frac{54-50}{50}=\frac{4}{50}$ = 8%
78. 1 - 20% = 0.8
    90×0.8 = 72 mph

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79. 47 yards = 141 ft
141 - 95 = 46

80. 2500÷10×3
= 750 hours

81. $2\frac{2}{3}$×60 = 120 + 40 = 160 (min)

82. 26×26×10×10×10 = 676000

83. 26×25 = 650
10×9×8 =720
650×720 = 468000

84. 5×26×9×10×10 = 117000

85. 5×25×9×9×8 = 81,000

86. 5×4×3×2×1 = 120 ways

87. $\frac{35}{5}$×8 = 7×8 = $56.00

88. Archer B
(archer A) $\frac{5}{6}=\frac{35}{42}<\frac{36}{42}=\frac{6}{7}$ (archer B). Thus, archer B is better at shooting.

89. 54÷6 = 9
9×5 = 45 (girls)
9×11 = 99 (students)

90. 35×$\frac{5}{7}$ = 25 gallons

91. 35×$\frac{2}{7}$ = 10 gallons

92. 28÷(2 + 5) = 4 quarts
2×4 = 8 gallons = 32 quarts

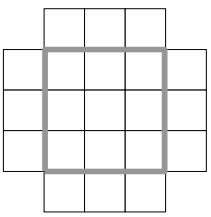
93. $1\frac{1}{4}:2\frac{1}{2}$ = 1:2
3×2 = 6 cups

94. B
312÷6 = 52 mph (car)
$\frac{376}{7}$= 53 mph (truck)

95. 60 - 32 = 28
28÷4 = 7 hr

96. Let x be the ones digit, the tens digit is x+2, and the hundreds digit is x+3. Since the sum of the tens and hundreds digits is x+2+x+3 = 2x+5, which is three times the ones digit, so we have
2x+5 = 3x
$\Rightarrow x = 5$
Ans = 875

97. There are 21 one-by-one's.
There are 4 + 2×4 = 12 two-by-two's
There are 1 + 1×4 = 5 three-by-three's
Ans = 38 squares in total



98. B
$9\times10^5\times5$ = 4,500,000

99. B
They are 5 min apart every 2 hours.
To be 60 min ahead, it takes
60÷5×2 = 24 hours.

100. 372 – 307 = 65 (miles per hour)
242 - 3×65 = 242 – 195 = 47 mi left

101. 2 ft = 24 in
3 ft = 36 in
(24÷2)×(36÷3) = 12×12 = 144

102. $65\frac{mile}{hour}=65\frac{5280ft}{60\times60\,sec}=95\frac{1}{3}$ = 95 1/3 ft/sec

103. $1\frac{g}{ml}=1\frac{0.001kg}{0.001l}=\frac{0.001\times2.205lb}{0.001l}$ = 2.205 lb per liter

104. 1 mile^2 = 640 acres
1 acre = $\frac{1}{640}$ mile^2 = $\frac{1}{640}$ mile^2 = $\frac{2560000}{640}$ m^2 = 4,000 m^2

105. Method I) Dynamic

Trials	Dime	Nickle	Penny	Tot#
#1		20		20
#2		19	5	24
#3	3	13	5	**21**
#4	3	12	10	25
#5	7	4	10	**21**

Method II) Algebraic
Here is the solution using number theory of semi-group.
$d + n + p = 21$ …① (number of coins)
$10d + 5n + p = 100$ …② (value of the coins)
$9d + 4n = 79$ (② - ①)
$8d + d + 4n = 79$
$4(2d + n) = 79 - d$ (a 4-multiple)
$d = 3, 7, 11, \ldots$
$d = 3, n = 13, p = 5$
$d = 7, n = 4, p = 10$
Ans = 3 D & 13 N & 5 P & 7 D & 4 N & 10 P

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Answer Key

1. $y = -3x + 6$
2. First of all, we know the equation of the line should be something like $y = \frac{1}{2}x + b$ since the line passes through (-2, 3), we conclude that b=4.
3. First we need to decide the slope of the line, using the slope formula, we know slope = $\frac{-4}{7}$. Thus, the equation is something like $y=\frac{-4}{7}x + b$. Since the line passes through (-3, -2), b=$\frac{-26}{7}$.
4. $y = x + 1$
5. These two points are the x– and y–intercepts. The equation is $\frac{1}{3}x + \frac{1}{4}y = 1$.
6. Being parallel to $3x + 2y = 1$, so the equation of the line should be something like $3x+2y = c$. Passing through the point (1, -2 leads us to solve for c, thus, $c = -1$.
7. The equation should be as $y + 3x + c$. Since its y–intercept = 6, it must passes through (0, 6). Thus, $6 + c = 0 \Rightarrow c = -6$. So, the equation should be $y + 3x – 6 = 0$.
8. $x = 3$
9. Since 1:–3 = –2:6, they are parallel.
10. Since the slope of the first line is $-\frac{2}{3}$ and the second one has slope = $\frac{3}{2}$, thus they are perpendicular.
11. Both have the same slope 3, so they are parallel.
12. They are neither parallel nor perpendicular.
13. They are neither parallel nor perpendicular.
14. They are perpendicular since the first one is horizontal and the second one is vertical.
15. The slope is $\frac{1}{4}$. Thus, the line must be $x – 4y + c = 0$.
    Since passing through (1, -4), we have
    $(1) –4(-4) + c = 0$
    $17 + c = 0$
    $c = –17$
    The equation of the line is $4x – y – 8=0$.
16. The perpendicular line must be $4x + y + c = 0$.
    Since it passes through (1, -4), we have
    $4(1) + (-4) + c = 0$
    $c = 0$
    Thus, L_2:$4x + y = 0$.
17. a) slope vector = [3, 5]

    b) normal vector = [5, -3]

    c) Lp: $5x – 3y = -5$

    d) Np: $3x + 5y = -3$

    e) Lq: $5x – 3y = 25$

    f) Nq: $3x + 5y = 117$
18. a) slope vector = [4, -3]

    b) normal vector = [3, 4]

    c) Lp: $3x + 4y = -5$

    d) Np: $4x – 3y = -15$

    e) Lq: $3x + 4y = 95$

    f) Nq: $4x – 3y = 35$
19. a) slope vector = [5, -1]

    b) normal vector = [1, 5]

    c) Lp: $x + 5y = -8$

    d) Np: $5x – y = -14$

    e) Lq: $x + 5y = 62$

    f) Nq: $5x – y = 76$
20. a) slope vector = [7, 8]

    b) normal vector = [8, -7]

    c) Lp: $8x – 7y = -22$

    d) Np: $7x + 8y = 9$

    e) Lq: $8x – 7y = -47$

    f) Nq: $7x + 8y = 199$

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21. a) slope vector = [8, 5]

    b) normal vector = [5, -8]

    c) Lp: $5x - 8y = 16$

    d) Np: $8x + 5y = -10$

    e) Lq: $5x - 8y = 26$

    f) Nq: $8x + 5y = 95$

22. a) C = (-2, 5)
    b) $r^2 = 29$
    c) $(x + 2)^2 + (y - 5)^2 = 29$
    d) AB: $5x - 2y = -20$
    e) Tc: $2x + 5y = 21$
    f) Ta: $2x + 5y = -8$
    g) Tb: $2x + 5y = 50$

23. a) C = (8, 9)
    b) $r^2 = 34$
    c) $(x - 8)^2 + (y - 9)^2 = 34$
    d) AB: $5x - 3y = 13$
    e) Tc: $3x + 5y = 69$
    f) Ta: $3x + 5y = 35$
    g) Tb: $3x + 5y = 103$

24. a) C = (4, 11)
    b) $r^2 = 41$
    c) $(x - 4)^2 + (y - 11)^2 = 41$
    d) AB: $5x - 4y = -24$
    e) Tc: $4x + 5y = 71$
    f) Ta: $4x + 5y = 30$
    g) Tb: $4x + 5y = 112$

25. a) C = (6, 2)
    b) $r^2 = 37$
    c) $(x - 6)^2 + (y - 2)^2 = 37$
    d) AB: $6x - y = 34$
    e) Tc: $x + 6y = 18$
    f) Ta: $x + 6y = -19$
    g) Tb: $x + 6y = 55$

26. a) C = (11, 6)
    b) $r^2 = 61$
    c) $(x - 11)^2 + (y - 6)^2 = 61$
    d) AB: $6x - 5y = 36$
    e) Tc: $5x + 6y = 91$
    f) Ta: $5x + 6y = 30$
    g) Tb: $5x + 6y = 152$

27. a) Lp: $2x + 9y = 23$
    Lq: $2x + 9y = 33$
    b) Np: $9x - 2y = -24$
    Nq: $9x - 2y = 21$
    c) N/A

28. a) Lp: $3x + 2y = 4$
    Lq: $3x + 2y = 19$
    b) Np: $2x - 3y = -6$
    Nq: $2x - 3y = 4$
    c) N/A

29. a) Lp: $7x + 5y = -12$
    Lq: $7x + 5y = 93$
    b) Np: $5x - 7y = 2$
    Nq: $5x - 7y = 77$
    c) N/A

30. a) Lp: $10x + 3y = -17$
    Lq: $10x + 3y = 33$
    b) Np: $3x - 10y = -16$
    Nq: $3x - 10y = -1$
    c) N/A

31. a) Lp: $4x + y = -9$
    Lq: $4x + y = 11$
    b) Np: $x - 4y = -15$
    Nq: $x - 4y = -10$
    c) N/A

32. a) $(x + 2)^2 + (y + 3)^2 = (2)^2$
    b) C = (-2, -3)
    c) R = 2

33. a) $(x - 0)^2 + (y - 0)^2 = (5)^2$
    b) C = (0, 0)
    c) R = 5

34. a) $(x - 5.5)^2 + (y - 2)^2 = (2)^2$
    b) C = (5.5, 2)
    c) R = 2

35. a) $(x + 3)^2 + (y + 2.5)^2 = (2)^2$
    b) C = (-3, -2.5)
    c) R = 2

36. a) $(x - 2.5)^2 + (y - 2.5)^2 = (3)^2$
    b) C = (2.5, 2.5)
    c) R = 3

37. a) 5/6
    b) -5
    c) $y = (5/6)x - 5$
    d) -6/5
    e) $y - 6 = -6/5(x + 10)$
    f) $y = (-6/5)x - 6$

38. a) 4/3
    b) 4
    c) $y = (4/3)x + 4$
    d) -3/4
    e) $y + 3 = -3/4(x - 8)$
    f) $y = (-3/4)x + 3$

39. a) 2
    b) 8
    c) $y = (2)x + 8$
    d) -1/2
    e) $y + 1 = -1/2(x - 4)$
    f) $y = (-1/2)x + 1$

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40. a) 7/6
    b) 7
    c) $y = (7/6)x + 7$
    d) -6/7
    e) $y + 6 = -6/7(x - 14)$
    f) $y = (-6/7)x + 6$

41. a) 2
    b) 2
    c) $y = (2)x + 2$
    d) -1/2
    e) $y + 1 = -1/2(x - 4)$
    f) $y = (-1/2)x + 1$