Answer Key

1. 8.5
2. 7.8
3. 4.84
4. 8.4
5. 11.24
6. 9.15
7. 10.45
8. 9.645
9. 9.282
10. 7.569
11. 1.66
12. 6.1
13. 1.07
14. 0.69
15. 3.46
16. 0.96
17. 0.99
18. 1.94
19. 0.43
20. 0.65

21. 53
22. 33
23. 35
24. 34
25. 23
26. 16
27. 51
28. 31
29. 36
30. 46
31. 1/2
32. 1/3
33. 1/8
34. 1/4
35. 2/7
36. 4/7
37. 1/5
38. 1/6
39. 5/6
40. 3/7

41. 2/9
42. 2/5
43. 1/9
44. 1/7
45. 3/5
46. 2/3
47. 3/4
48. 4/5
49. 4/9
50. 3/10
51. 5 1/6
52. 3 2/11
53. 3 3/7
54. 3 3/8
55. 4 7/8
56. 5 1/8
57. 4 7/9
58. 5 2/9
59. 3 1/11
60. 3 1/12

61. 21 1/4
62. 20 1/6
63. 19 1/8
64. 3 3/9
65. 6 1/6
66. 9 1/4
67. 4 3/6
68. 5 1/8
69. 4 2/9
70. 4 4/6
71. 35
72. 42
73. 10
74. 12
75. 45
76. 24
77. 25
78. 21
79. 24
80. 24

81. 60
82. 5
83. 75
84. 192
85. 4
86. 12
87. 60
88. 68
89. 189
90. 9 & 3 (R)
91. 96
92. 6
93. 396
94. 3996
95. 39996
96. 72
97. 16
98. 30
99. 144
100.5

MAP 239+ (T3) Issue 7

101. 12:00 – 7:45 = 4:15
     4:15 + 4:15 = 8:30 = <u>8 hr & 30 min</u>
102. 21 & 14
103. C
     Since both are 10 pounds, so it does not matter which one to go first.
104. A
     The bag with paper towel is larger because paper take more space than flour.
105. 2002
106. 16
107. $2\times(10+16) = 52$
108. 932 – 392 = <u>540</u>
109. $28\div4 = 7$
     $7^2 =$ $\boxed{49\ in^2}$
110. B
111. B
112. $50 - 4\times5 =$ $\boxed{\$30}$
113. D
114. $7\times6 - 2 = 42 - 2 = 40$
115. $4\times6 - 3 =$ <u>21</u>
116. $1.30
117. 8741
118. 1478
119. $5\times19 =$ <u>$95</u>
120. D

Answer Key

1. 3
2. 6
3. 10
4. 14
5. 30
6. 22
7. 15
8. 21
9. 27
10. 33
11. 4.2
12. 4.8
13. 2.7
14. 4.5
15. 6.3
16. 8.1
17. 9.9
18. 2.1
19. 3.5
20. 4.9

21. 27
22. 33
23. 36
24. 39
25. 42
26. 4.5
27. 48
28. 51
29. 54
30. 15
31. $\frac{1}{36}$
32. $\frac{3}{8}$
33. $\frac{3}{8}$
34. $\frac{11}{30}$
35. $\frac{14}{45}$
36. $\frac{3}{10}$
37. $\frac{5}{6}$
38. $\frac{9}{20}$
39. $\frac{5}{12}$
40. $\frac{7}{24}$

41. 10000, 100000
42. 20000, 200000
43. 30000, 300000
44. 40000, 400000
45. 50000, 500000
46. 60000, 600000
47. 70000, 700000
48. 80000, 800000
49. 90000, 900000
50. 100000, 1000000
51. .006
52. .000005
53. .098
54. .15
55. 0.05
56. 1.4
57. .7
58. .006
59. 0.15
60. .035

61. -.001
62. .03
63. 0.2
64. 0.072
65. 0.06
66. 0.09
67. .01
68. .04
69. .006
70. 20
71. $40 each baby pig
72. $40 each day
73. 40 pages a day
74. $40 each sister
75. 1200
76. $12
77. 43 sheep
78. $15
79. 5 (bulbs)
80. 7 (boxes)

81. 33 (points)
82. 40 days
83. 12 (length)
84. 28
85. 140 cm
86. 23 waffles
87. $12
88. 5 (cartons)
89. $10
90. $1.25 for change
91. 38 ft
92. $3,150
93. 160 ft (perimeter)
94. 1500 sq. ft (area)
95. 20 sections
96. 220 (ft^2)
97. 5 cans
98. $60
99. 50 in
100. 150 sq. in.

MAP 249+ (T3) Issue 7

101. $192 \div 12 = 16$ in

102. $20 \times 12 = 240$
$\frac{3}{4} \times 240 = 180$ in^2

103. $\frac{1}{2} \times 5 \times (3 + 7) = 25$

104. 3 in = $\frac{1}{4}$ ft
$4 \times 5\frac{1}{3} = 21$ ft

105. $80 \div 10 = 8$

106. $50 \div 2 = 25$ (half-perimeter)
$25 - 10 = 15$ (length)
15×10
= 150 square inches

107. $74 \div 2 = 37$
$37 - 12 = 25$
$25 \times 12 = \underline{300 \text{ inches}^2}$

108. The length is 20 since
$56 \div 2 = 28$
$28 - 8 = 20$

109. $36 = 6 \times 6$
$4 \times 6 = \underline{24 \text{ ft}}$

110. $60 \div 4 = 15$
$15^2 = \underline{225 \text{ in}^2}$

Answer Key

1. $8\frac{1}{6}$
2. $215\frac{1}{35}$
3. $428\frac{1}{35}$
4. $37\frac{1}{35}$
5. $568\frac{1}{35}$
6. $33\frac{1}{15}$
7. $215\frac{1}{35}$
8. $16\frac{1}{14}$
9. $145\frac{1}{35}$
10. $533\frac{1}{35}$
11. 961
12. 1681
13. 2601
14. 3721
15. 121
16. 10201
17. 102.01
18. 12321
19. 123.21
20. 1.2321

21. $\frac{11}{75}$
22. $\frac{23}{72}$
23. $\frac{31}{36}$
24. $\frac{41}{144}$
25. $\frac{47}{216}$
26. $\frac{59}{144}$
27. $\frac{71}{108}$
28. $\frac{19}{90}$
29. $\frac{1}{12}$
30. $\frac{1}{96}$
31. 180,000
32. 16,000
33. 10,000
34. 12
35. 1.4
36. 0.42
37. 1.4
38. 0.03
39. 2.5
40. 40

41. 320,000
42. 160000
43. 3,000
44. 1500
45. 1.4
46. 2
47. 0.14
48. 42
49. 1.2
50. 0.48
51. 0.24
52. 0.9
53. 100
54. 0.24
55. 80
56. 125
57. 8
58. 2.5
59. 1.4
60. 0.375

61. 0.015
62. 3.2
63. 0.5
64. 0.175
65. 0.24
66. 1800
67. 0.6
68. 0.025
69. 0.3
70. 0.008
71. 80
72. 100 cm
73. 70 cm
74. 36 (m^2)
75. 30 in (length)
76. 300 in^2
77. 78.5 (sq. inches).
78. 70 in
79. 250 in^2
80. 300 (cm^2)

81. 300 (cm^2)
82. 6 faces
83. 100 in^3
84. 12 edges
85. 8 vertices
86. 50
87. 10
88. 30 in
89. 14 in
90. 4 (in)
91. 81/256
92. $4\frac{1}{2}$
93. 1 3/4
94. 24
95. 330 miles
96. D
97. 7 1/3
98. D
99. 14,776 feet
100. 8 1/4 quarts

101. 11×60 = 660 ft (1 min)
     5280÷660 = 8 min
     $\frac{60}{8}$ = 7.5 mi
102. 8×120 = 960 min = 16 hr = 16 hr
103. $\frac{1200}{50}$×4 = 24×4 = 96 min
104. $\frac{10}{8} + \frac{10}{20} = 1\frac{1}{4} + \frac{1}{2} = 1\frac{3}{4}$ hr = 1 hr & 45 min
105. 50×3 = 150 mi
106. 200×75% = 150 acres
107. 18×3 = 54
     15×2 = 30
     54 + 30 = 84 mi
108. 720÷36 = 20
     20×3 = 60 hr
109. 21×70% = 21×0.7 = $14.70

Answer Key

1. $6x^3 + 4x^2 - 4x + 6$
2. $3x^4 - 6x^3 - 5x^2 - 8$
3. $15x^3 - 6x^2 - 21x$
4. $-18x^2 - 30x - 36$
5. $-x^4 + 12x^3 + 17x^2$
6. $-3x^3 + 10x^2 + 11x$
7. $4x^3 - 5x^2 - 2x + 15$
8. $6x^4 - 7x^3 + 9x^2 - 9x$
9. $6x^4 + 10x^2 - 2x - 4$
10. $2x^4 - 12x^3 - 8x^2$
11. $6x^2 + 6x + 12$
12. $4x^4 - 12x^3 + 12x^2$
13. $-4x^3 - 4x^2 + 2x - 12$
14. $6x^4 - 10x^3 - 4x$
15. $6x^4 - 6x^3 + 5x^2 - 3x - 6$
16. $6x^4 + 13x^3 + 9x^2 + 4x$
17. $12x^4 + 20x^3 - 20x^2$
18. $6x^4 + 10x^3 + 6x^2$
19. $4x^3 + 8x^2 + 9x + 6$
20. $6x^4 - x^2 - x - 2$
21. $x^2 - 5x + 6$
22. $x^2 + 4x - 21$
23. $x^2 + x - 12$
24. $x^2 - x - 6$
25. $x^2 - 4x + 3$
26. $x^2 + 5x - 24$
27. $2x^2 + 7x + 6$
28. $12x^2 - 19x + 4$
29. $10x^2 + 17x + 3$
30. $2x^2 + x - 21$
31. $(x + 3)(x + 8)$
32. $(x + 1)(x + 4)$
33. $(x + 1)(x + 7)$
34. $(3x + 1)(2x + 1)$
35. $(x - 6)(x - 4)$
36. $(x - 4)(x + 3)$
37. $(3x + 4)(2x - 3)$
38. $(x - 2)(x + 4)$
39. $(x - 7)(x + 4)$
40. $(x - 2)(x + 1)$
41. $x^2, x, 1$
42. 15
43. 31
44. 14
45. $15x^2 + 31x + 14$
46. $20x^2$
47. $60x^2$
48. $12x$
49. $22x$
50. $x^2 + x - 6$

		x	-2
$\times)$		x	$+3$
		$3x$	-6
	x^2	$-2x$	
	x^2	$+x$	-6

$12x^2 + 13xy + 6y^2$

		$2x$	$+3y$
$\times)$		$3x$	$+2y$
		$+4xy$	$+6y^2$
	$12x^2$	$+9xy$	
	$12x^2$	$+13xy$	$+6y^2$

51.
52. $0.\overline{142857}$
53. $0.\overline{285714}$
54. $0.\overline{428571}$
55. $0.\overline{571428}$
56. $0.\overline{714285}$
57. $0.\overline{857142}$
58. $0.\overline{9} = 1$
59. $0.\overline{9} = 1$
60. $0.\overline{9} = 1$
61. $0.0\overline{714285}$
62. 81/256
63. $4\frac{1}{2}$
64. $1\frac{3}{4}$ = 1 3/4
65. 24
66. 264÷12 = 22 (miles per gallon)
    15×22 = 330 miles
67. D
    A J T SM

68. 1 + 2 + 8 = 11
    $11\times\frac{2}{3} = 7\frac{1}{3}$ = 7 1/3
69. D
70. 14,776 feet
71. 1 quart = 32 ounces
    24 ounces = $\frac{24}{32} = \frac{3}{4}$ quart
    10 pints = 5 quarts
    $2\frac{1}{2} + \frac{3}{4} + 5 = 8\frac{1}{4}$ = 8 1/4 quarts
72. 11×60 = 660 ft (1 min)
    5280÷660 = 8 min
    $\frac{60}{8}$ = 7.5 mi
73. 8×120 = 960 min = 16 hr = 16 hr
74. $\frac{1200}{50}\times4 = 24\times4 = 96$ min
75. $\frac{10}{8} + \frac{10}{20} = 1\frac{1}{4} + \frac{1}{2} = 1\frac{3}{4}$ hr = 1 hr & 45 min
76. 50×3 = 150 mi
77. 200×75% = 150 acres
78. 18×3 = 54
    15×2 = 30
    54 + 30 = 84 mi
79. 720÷36 = 20
    20×3 = 60 hr
80. 21×70% = 21×0.7 = \$14.70
81. 10
82. (160×4)×3 = \$1920
83. 500×6%=30
    500+\$30=\$530
84. 401
    4 + 0 + 1 = 5
85. 72
86. 150÷6 = 25
    25 = 5×5
    5×5×5 = 125 in^3
87. $\frac{1}{2}(10+x) = 20$
    $x = 30$
88. 75 in^2
89. $\frac{3}{12} = \frac{1}{4}$ = 1/4
90. $\frac{3}{12} = \frac{1}{4}$ = 1/4
91. $\frac{1}{4}$ = 1/4
92. $\frac{7}{16}$ = 7/16
93. 32
94. 81 = 9 × 9
    9÷2 = 4.5
    2(9+4.5) = 27 in
95. (a) 60×20%=60×0.2 = \$12
    (b) 60 – 12 = \$48
96. 80%(40) = 0.8×40 = \$32.00
97. 150 – 30 = \$120.00
98. 80%(**125**) = 100
    or
    100÷0.8 = \$125.00
99. 1 + 20% = 1.2
    3,000×1.2 = 3,600
100. **5000**×1.2 = 6000
    or
    6000÷1.2 = 5000

Answer Key

1. $12x^3 - 8x^2 + x - 5$
2. $2x^3 + 19x^2 - x - 2$
3. $-3x^3 - 2x^2 + 8$
4. $-4x^3 - 4x^2 + x - 3$
5. $21x^2 + 1$
6. $-38x^2 + 74$
7. $-8x^3 + 63x^2 + 7x - 31$
8. $36x + 2$
9. $-2x^3 - 2x^2 + 8x - 1$
10. $-20x^6 + 12x^5 + 4x^3 + 6x^4 + 9x^2 = -20x^6 + 12x^5 + 6x^4 + 4x^3 + 9x^2$
11. $x^2 - 4x - 32$
12. $x^2 + 4x - 32$
13. $x^2 - 8x + 15$
14. $2x^2 + 3x - 14$
15. $6x^2 + 23x + 21$
16. $6x^2 + 27x + 27$
17. $12x^2 + 17x + 6$
18. $6x^2 - 25x + 24$
19. $28x^2 + 26x + 6$
20. $24x^2 + 24x + 6$
21. $x^2 - 4x - 32$
22. $x^2 + 4x - 32$
23. $x^2 - 8x + 15$
24. $2x^2 + 3x - 14$
25. $6x^2 + 23x + 21$
26. $6x^2 + 27x + 27$
27. $12x^2 + 17x + 6$
28. $6x^2 - 25x + 24$
29. $28x^2 + 26x + 6$
30. $24x^2 + 24x + 6$
31. $(3x + 2)(x + 4)$
32. $(x + 3)(x + 6)$
33. $(x + 5)(x + 6)$
34. $(x - 9)(x - 2)$
35. $(x - 2)(x - 1)$
36. $(x - 3)(x + 6)$
37. $(x - 2)(x + 8)$
38. $(x - 8)(x + 1)$
39. $(x - 6)(x + 5)$
40. $(2x + 7)(4x - 1)$
41. $(x + 6)(x + 3)$
42. $(x + 2)(x + 10)$
43. $(x - 5)(x - 2)$
44. $(x - 8)(x - 3)$
45. $(x - 4)(x + 7)$
46. $(x - 1)(x + 7)$
47. $(x - 6)(x + 2)$
48. $(x - 3)(x + 2)$
49. $(3x + 4)(x + 4)$
50. $(3x + 2)(3x - 5)$
51. a) 4
    b) $4x - y = 8$
    c) $4x - y = -10$
    d) $x + 4y = 53$
    e) $x + 4y = 36$
52. a) 5/9
    b) $5x - 9y = -20$
    c) $5x - 9y = -33$
    d) $9x + 5y = 176$
    e) $9x + 5y = 70$
53. a) 1
    b) $x - y = -3$
    c) $x - y = 0$
    d) $x + y = 13$
    e) $x + y = 5$
54. a) -6
    b) $6x + y = 40$
    c) $6x + y = -12$
    d) $x - 6y = -129$
    e) $x - 6y = -18$
55. a) -9/10
    b) $9x + 10y = 51$
    c) $9x + 10y = 38$
    d) $10x - 9y = -100.2$
    e) $10x - 9y = -64$
56. a) + 3, – 6
    b) 1.5
    c) 1.5, -81
    d) 4
    e) 4, + 3, – 6
    f) 4, -12, -72
    g) 4, 1.5, -81

57. a) – 2, + 5
    b) -1.5
    c) -1.5, -24.5
    d) 2
    e) 2, – 2, + 5
    f) 2, 6, -20
    g) 2, -1.5, -24.5
58. a) – 6, + 4
    b) 1
    c) 1, -75
    d) 3
    e) 3, – 6, + 4
    f) 3, -6, -72
    g) 3, 1, -75
59. a) + 2, – 6
    b) 2
    c) 2, -80
    d) 5
    e) 5, + 2, – 6
    f) 5, -20, -60
    g) 5, 2, -80
60. a) + 4, – 10
    b) 3
    c) 3, -98
    d) 2
    e) 2, + 4, – 10
    f) 2, -12, -80
    g) 2, 3, -98
61. B
62. C
63. B
64. D
65. A
66. C
67. A
68. D
69. D
70. A
71. 27
72. B
73. B
74. C
75. D
76. C
77. C
78. D
79. B
80. D

Answer Key

1. $30x^4y^4z^5$
2. $5x^5y^3z^5$
3. $4\frac{1}{xyz^2}$
4. $\frac{1}{3}\frac{1}{y^2z}$
5. $1\frac{1}{2}x^3z$
6. $\frac{4}{5}xz^3$
7. $\frac{1}{10}\frac{1}{z}$
8. $15\frac{x^2}{y}$
9. $5x^3z^3$
10. $1x^4z^3$
11. 100
12. 64
13. 9
14. 81
15. 16
16. 64
17. 64
18. 64
19. 256
20. 81
21. 2
22. 2
23. 3
24. 2
25. 2
26. 3
27. 4
28. 2
29. 3
30. 2
31. $5(2x + 3)(4x – 3)$
32. $12(2x + 3)(4x – 5)$
33. $-(3x – 8)(5x + 4)$
34. $-6(3x + 2)(4x – 3)$
35. $-3(6x – 7)(5x + 3)$
36. $3x + 1$
    $9x^2 + 6x + 1 =$
    $(3x + 1)(3x + 1)$
    $9x^2 + 15x + 4 =$
    $(3x + 1)(3x + 4)$
37. $3x + 4$
    $6x^2 + 17x + 12 =$
    $(3x + 4)(2x + 3)$
    $3x^2 + 13x + 12 =$
    $(3x + 4)(x + 3)$
38. $3x – 4$
    $12x^2 – 25x + 12 =$
    $(3x – 4)(4x – 3)$
    $3x^2 – 7x + 4 =$
    $(3x – 4)(x – 1)$
39. $3x + 1$
    $3x^2 + 13x + 4 =$
    $(3x + 1)(x + 4)$
    $3x^2 + 7x + 2 =$
    $(3x + 1)(x + 2)$
40. $3x + 1$
    $12x^2 + 7x + 1 =$
    $(3x + 1)(4x + 1)$
    $6x^2 + 5x + 1 =$
    $(3x + 1)(2x + 1)$
41. $\frac{-2(2n+3)-6(n-6)}{(n-6)(2n+3)}$
    $= \frac{-10n+30}{(n-6)(2n+3)}$
42. $\frac{9y+10x}{12x^2y^2}$
43. $\frac{2x+7(x+4)}{(x+4)(x-4)}$
    $= \frac{9x+28}{(x+4)(x-4)}$
44. $\frac{(2x+7)(x-3)}{(5x-1)(2x+7)}$
    $= \frac{x-3}{5x-1}$
45. $\frac{1}{(a-9)(a+6)} - \frac{4}{(a-9)(a+5)}$
    $= \frac{(a+5)-4(a+6)}{(a-9)(a+6)(a+5)}$
    $= \frac{-3a-19}{(a-9)(a+6)(a+5)}$
46. $\frac{x-8}{(x-2)(x-4)} - \frac{x+6}{(x+3)(x-2)}$
    $= \frac{(x-8)(x+3)-(x+6)(x-4)}{((x-4)x+3)(x-2)}$
    $= \frac{-7x}{(x-4)(x+3)(x-2)}$
47. $\frac{2x+5(x+4)}{x(x+4)}$
    $= \frac{7x+20}{x(x+4)}$

48. $\frac{36p^2+(3p+q)^2-(3p-q)^2}{(3p+q)(3p-q)}$
$= \frac{36p^2+12pq}{(3p+q)(3p-q)}$
$= \frac{12p(3p+q)}{(3p+q)(3p-q)}$
$= \frac{12p}{3p-q}$

49. $\frac{r^2-s^2}{rs} \div \frac{s-r}{rs}$
$= -(r + s)$

50. $\frac{x^2-2x-3}{x+2} \div \frac{x^2+4x+3}{x+2}$
$= (x^2 - 2x - 3) \div (x^2 + 4x + 3)$
$= \frac{(x-3)(x+1)}{(x+3)(x+1)}$
$= \frac{x-3}{x+3}$

51. $\frac{x^2}{(x-2)(x-1)} \div \frac{x^2}{(x-2)(x-3)}$
$= \frac{x-3}{x-1}$

52. -1

53. $(\frac{y^2-y-2}{y-3})(\frac{y^2+y-2}{y+3}) \div (\frac{y^4-5y^2+4}{y^2-9})$
$= (y - 2)(y + 1)(y + 2)(y - 1) \div [(y + 1)(y - 1)(y + 2)(y - 1)]$
$= 1$

54. $\frac{u^2+v^2}{u+v} \times \frac{v^2-u^2}{u^2v^2} \div \frac{u^4-v^4}{u+v}$
$= \frac{-1}{u^2v^2}$

55. 8
Assumption of non-zero denominator: $n \neq 0$.
Multiply both sides by $2n$.
$10 + n = 18$
$n = 8$ (valid)

56. .7
Assumption of non-zero denominator: $x \neq 0$. Let's multiply $12x$ to both sides:
$9 + 10x = 16$
$10x = 7$
$x = .7$ (valid)

57. 5
Assumption of non-zero denominator: $n \neq 0$. Let's multiply both sides by n:
$47 - n = 8n + 2$
$9n = 45$
$n = 5$ (valid)

58. -2.5
Assumption of non-zero denominator: $x \neq -5$.
Let's multiply both sides by $x + 5$.
$x - 2(x + 5) = 3x$
$4x = -10$
$x = -2.5$ (valid)

59. $\frac{-85}{18}$
Assumption of non-zero denominator: $x \neq 0$.
Multiply both sides by $30x$.
$105 + 18x = 20$
$18x = -85$
$x = \frac{-85}{18}$

60. 1
Multiply both sides by 12.
$4(x - 2) + 3(x + 1) = 2$
$4x - 8 + 3x + 3 = 2$
$7x - 5 = 2$
$7x = 7$
$x = 1$

61. $\frac{9}{7}$

62. $\frac{9}{8}$

63. $\frac{9}{8}$

64. $\frac{8}{7}$

65. $\frac{9}{7}$

66. $\frac{7}{6}$

67. $\frac{9}{4}$

68. $\frac{8}{9}$

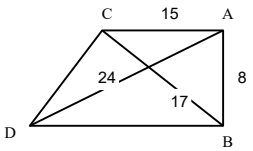
69. $\frac{6}{5}$

70. $\frac{9}{2}$

71. Substituting $y = x - 3$ in $y = 2x^2 - x - 7$, we have
$x - 3 = 2x^2 - x - 7$
$\Rightarrow 2x^2 - 2x - 4 = 0$
$\Rightarrow x^2 - x - 2 = 0$
$\Rightarrow (x-2)(x+1)=0$
$\Rightarrow x = 2$ or -1
$\Rightarrow y = -1$ or -4
The solutions are $(x, y) = (2, -1)$ and $(-1, -4)$

72. $\frac{2M}{\frac{M}{a}+\frac{M}{b}} = \frac{2}{\frac{1}{a}+\frac{1}{b}} = \frac{2}{\frac{a+b}{ab}} = \frac{2ab}{a+b}$

73. $1 + 3 + 5 + \ldots + (2n-1) = n^2$



74.

75. 8
Since ΔBAD is a right triangle, Pythagorean theorem applies, thus $x^2 + 15^2 = 17^2 \Rightarrow x = 8$.

76. $16\sqrt{2}$

77. CD ≈ 11.05

78. $\frac{d}{x+y}$

79. Let a, b, c, d, and e are the five numbers. Note that $a + e = b + d = 2c = m + n$. So, the sum of these five number is $\frac{5}{2}(m+n)$.

80. \$750
With his normal working hours after the raise, he deserves \$400×1.25=\$500. Since he work overtime (60-hour), the total number of hours become $\frac{3}{2}$ to the original (40-hour), therefore, his salary should become $500\times\frac{3}{2}$=\$750.

81. The total parts is 1+2+3 = 6, thus a part has a share of 180°÷6=30°. Thus, ∠A=30°, ∠B=60° and ∠C=90°.

82. Since ∠A and ∠B are complementary, ∠C = 90°. Also, since ∠A:∠B = 4:5, ∠A=40° and ∠B=50°.

83. ∠A:∠B = 2:1, ∠B:∠C = 3:1, therefore, ∠A:∠B:∠C = 6:3:1. The total parts is 10, therefore, ∠A = 6×18°=128°, ∠B=3×18° = 54°, and ∠C = 18°.

84. Note that ∠C = 60°. Why? Let x be the measure of ∠C. We have ∠A+∠B = 2x. Now that the sum of the three interior angles is x + 2x = 3x = 180°. Thus, x = ∠C = 60°. ∠A+∠B = 120°. By the other condition, we have ∠A-∠B = $\frac{4}{3}$∠C = 80°. Thus, ∠A=100° and ∠B = 20°.

85. Since ∠B:∠C = 2:3. Let ∠B = 2x, and ∠C = 3x. Use the other condition, we have 3(2x) + 4(3x) = 180°. Thus, 18x = 180°, x = 10°. We conclude that ∠B = 20°, ∠C = 30°, and ∠A = 180°-20°-30° = 130°.

86. $2^{3x} = 2^{12}$
$x = 4$

87. 64

88. $6x = \frac{11}{4}$
$x = \frac{11}{24}$

89. $2^x \cdot 3^x = 6^x = 6^{2(x-3)}$
$2(x - 3) = x$
$x = 6$

90. 32