

Answer Key

1. $x=2$
 $0.5x = 1$
 $x = 2$
2. -1
 $5(x + 1) - 7(x - 3) = 28$
 $5x + 5 - 7x + 21 = 28$
 $-2x = 2$
 $x = -1$
3. $x = 0$
 $12(\frac{1}{2}x + \frac{1}{3}x) = 12(\frac{1}{4}x)$
 $6x + 4x = 3x$
 $10x = 3x$
 $7x = 0$
 $x = 0$
4. Multiply both sides by 6, then we get
 $30 - 2(2x-3) = 3(3x-1)$
 $30 - 4x+6 = 9x - 3$
 $36-4x=9x-3$ $13x = 39$
thus $x = 3$.
5. $x = 4$
 $5x + 20 = 4x + 24$
 $x = 4$
6. $t=32$
 $4(\frac{1}{4}t + \frac{1}{2}t) = 4(24)$
 $t + 2t = 96$
 $3t = 96$
 $t = 32$
7. $x = \frac{7}{3}$
8. $x=9$
9. $18/5$
10. $x = \frac{16}{3}$
11. $23/9$
12. $n = 5/3$
13. $\frac{3(\text{pure})}{7(\text{alcohol})} = \frac{\Delta(\text{pure})}{56(\text{alcohol})}$
 $\Delta = 24$
14. $175:100 = 7:4$
15. $120:144 = 10:12 = 5:6$
16. \checkmark midsize: $\frac{210}{7} = 30$
minivan: $\frac{246}{10} = 24.6$
17. Tigers = $\frac{9}{36} = \frac{1}{4} = 0.25 <$
 $0.275 =$ Bucks \checkmark
18. Both have the same rate.
 $\frac{20}{24} = \frac{5}{6}$
 $\frac{30}{36} = \frac{5}{6}$
19. 6 min
20. 9 min
21. $\frac{40}{50} = \frac{4}{5}$
 $\frac{4}{5} \times 3 = 2.4$ min
22. 10.4 lb
23. $120 \times \frac{5}{30} = 20$ (Ann)
 $120 \times \frac{4}{20} = 24$ (Ben)
24. \checkmark A: $2.5 \div 10 = 0.25$ (per ounce)
B: $1.80 \div 6 = 0.30$ (per ounce)
25. Peter
26. (a) 5:6
(b) 14:11
(c) 7:2
27. (a) 5:2
(b) 3:2:10
(c) 4:5:25
28. S : F = $1\frac{1}{4} : 2\frac{1}{2} = 1 : 2 = 3 : 6$
6 cups of flour
29. $2 : 3 = 40 : 60$
 $60 \times \frac{2}{3} = 40$
30. shadow : height = $4 : 3$
= $24 : \underline{18 \text{ m}}$
31. 3 hours and 20 minutes
Needed to pay for 4 hours
 $5 + 3 \times 2 = \underline{\$11}$
32. $15 - 5 = 10$
 $10 \div 2 = 5$ (hours after first hour)
 $1 + 5 = \underline{6 \text{ hours}}$
33. $(\frac{1}{6} + 4\frac{1}{3}) \times 12 = 126$ roses
34. $60 \times \frac{7}{5} = \84
35. $1 - \frac{1}{4} = \frac{3}{4}$
 $9 \div \frac{3}{4} = 12$
36. B: 0.17
J: $55\% = 0.55$
N: 0.57
U: $\frac{1}{5} = 0.2$
Great Britain, United States, Japan, The Netherlands
37. 30 mon
38. $10 \div \frac{1}{3} = 30$
39. $\frac{3}{4} \times (1 - \frac{2}{3}) = \frac{1}{4}$
40. $\frac{5}{8} \times 16 = 10$ gal
41. D
42. $\frac{3}{8}, \frac{4}{8}$, and $\frac{5}{8}$
43. $6 \div 3 = 2$ (packs)
 $9.25 \times 2 = 18.50$
 $20 - 18.50 = \underline{\$1.50}$
44. $16 \times \frac{3}{2} = 24$
45. $210,000 \times \frac{3}{7} = 90,000$
46. $12 = 1, 22 = 4, \dots, 72 = 49$
There 7 of them.
47. $\frac{1}{8} < \frac{1}{7.5} = \frac{2}{15} < \frac{1}{7}$
48. $9 \times 8 = 72$ in = 6 ft
49. $15 \div \frac{5}{8} = 24$ mi
50. $15 \div \frac{3}{8} = 40$ mi
51. D: $36 \div \frac{4}{5} = 36 \times \frac{5}{4} = 45$
G: $45 \div \frac{3}{4} = 45 \times \frac{4}{3} = \underline{60}$
52. $\frac{2400}{80} - 14 = 16$
53. $1 - 62\% = 38\%$
54. $6 \times 3 = 18$
55. $26,000 \div 40,000 = 26 \div 40 = 0.65$
 $1 - 0.65 = 0.35 = 35\%$
56. $45 \div 75 = 3 \div 5 = 0.6 = 60\%$
57. $1 - 75\% = 25\% = \frac{1}{4}$ (loss)
 $\frac{1}{4} \times 28 = 7$ games
58. $0.15 \times 660 = \$99.00$
59. $34 \div 85 = 0.4 = 40\%$
60. $90 \times 20\% = 18$
 $90 + 18 = 108$
61. $5 \times 2 + 1 = 11$

R	B	W	G	P
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62. $20 - 4 + 1 = \underline{17}$
63. $\angle ADB$
= $\angle DBC + \angle DCB$

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- $= 70 + 70$
 $= 140$
64. B
65. 10101
66. 6 of them: 2400, 4200, 2040, 4020, 2004, 4002
67. 6
68. B
 The ratio of pieces after cutting is
 $1 : 2$
 $1 + 2 = 3$
 It should be a 3-multiple.
69. 3 : 1 (#seats occupied to empty)
 $6 \times 3 = 18$ (seated)
 2 : 1 (#people seated to unseated)
 $18 \div 2 = 9$
 $18 + 9 = \boxed{27}$
70. D
 Any odd number can be expressed as $2n - 1$.
 Let the 4 consecutive odd numbers be:

- $2n - 3, 2n - 1, 2n + 1, 2n + 3$
 The sum = $8n$, must be an 8-multiple.
71. $1 - \frac{2}{3} = \frac{1}{3}$
 $\frac{3}{4} - \frac{1}{3} = \frac{\boxed{5}}{12}$
72. $44 - 3 \times 4 = 32$
 $32 \div (3 + 5) = 4$ (min)
 $4 \times 5 = 20$
73. 6 of them:
~~(5, 5, 13)~~ Not working
 (6, 6, 11)
 (7, 7, 9)
 (8, 8, 7)
 (9, 9, 5)
 (10, 10, 3)
 (11, 11, 1)
74. $7 + 12 = 19$
75. The ones digit is deleted.
 $52713 \div 11 = 4792.091$
 $4792 + 4792 \cdot 1 = 52713$
 $4 + 7 + 9 + 2 + 1 = 23$
76. 23
77. $5 \times 15 = 75$
 Minimize the arrangement:

- 1, 2, **18**, 19, \square
 $75 - 40 = 35$
78. 4
 Only 4: SYZ, SYX, SYT, SRT
79. 9 different ways for 4 cars to exit.
 4 cars: ABCD
 4 exits: ABCD

Car	A	B	C	D
Exit	BCD	CDA	DAB	ABC
1	B	C	D	A
2	B	D	A	C
3	B	A	D	C
4	C	D	A	B
5	C	D	B	A
6	C	A	D	B
7	D	C	A	B
8	D	C	B	A
9	D	A	B	C

80. $AB = 8$
 $AC = 17$
 $BC = 15$
 $15 \div 2 = \boxed{7.5}$

Answer Key

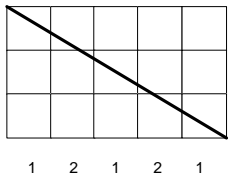
- | | | |
|---|--|--|
| 1. $11/6$ | Sam-Carla | 54. $4 + 28 + 8 = 40$ (total) |
| 2. $94 = x - 13$ | Chris-Megan | $\frac{4}{40} = 10\%$ |
| 3. $xy = 36$ or $x \cdot y = 36$ | 33. $\frac{1}{2}(4)(8 + 11) = 2 \times 19 = 38$ | 55. $\frac{28}{40} = 70\%$ |
| 4. $x + 3 = 12$ | 34. Square A has a side of 20-
$20 \div 4 = 15$ | 56. $10\% + 70\% = 80\%$ |
| 5. $8 + 2x = 24$ | $20^2 - 15^2 = 400 - 225 = 175$ | 57. $8\% \times 250 = 20$ |
| 6. $x = 17$ | in^2 | 58. $\frac{9}{15} = \frac{3}{5} = 60\%$
$1 - 60\% = 40\%$ |
| 7. $x = 5$ | 35. (outer circle area) - (inner
circle area) | 59. $\frac{10}{80} = \frac{1}{8} = 12.5\%$ |
| 8. -4 | $= 12^2\pi - 10^2\pi$ | 60. $46\% + 23\% = 69\%$
$1 - 69\% = 31\%$ |
| 9. $y = \frac{8}{5}$ | $= 44\pi$ | 61. 1 chopped, then 5 grow, or 4
added
6 chopped, then 30 grow, or
24 added.
$5 + 30 - 6 = 29$ |
| 10. -2 | 36. $36 = 6^2$ | 62. $1 + 36 = 37$
$1 \times 36 = 36$
$36 - 1 = \boxed{35}$ |
| 11. $8t + 40 = 6t - 36$
$2t = -76$
$t = -38$ | $6 \div 2 = 3$
$2(3+6) = 18 \text{ in}$ | 63. B
$55 = 5 \times 11$
$57 = 3 \times 19$
$51 = 3 \times 17$
$49 = 7 \times 7$
$91 = 7 \times 13$ |
| 12. $3 + 2(x + 5) = 18$
$3 + 2x + 10 = 18$
$2x + 13 = 18$
$2x = 5$
$x = 2\frac{1}{2}$ | 37. $(10 \times 20) - \{(12 + 20) \times 10 \div 2\} =$
$200 - 160 = 40$ | 64. walk: $0.4 \text{ hr} = 24 \text{ min}$
run: 14 min
$24 - 14 = \boxed{10}$ min longer |
| 13. $8:35 - 0:50 = 7:45 \text{ am}$ | 38. D | 65. $1 + 2 + 4 = 7$
$1 \times 2 \times 4 = 8$ |
| 14. $\frac{39}{3} \times 0.5 = 13 \times 0.5 = \6.50 | 39. $\angle AFD = 50^\circ$
$\angle EFA = 50^\circ$
$\angle EFC = 180^\circ - 50^\circ - 50^\circ =$
80° | 66. $2 + 83 = 85$
$2 \times 83 = \boxed{166}$ |
| 15. $3:45 \text{ pm}$ | 40. $30 \div \frac{3}{5} = 50$ | 67. B |
| 16. $42 \text{ min } 16 \text{ sec}$ | 41. $\frac{1}{3} \times 30 = 10$ (girls)
$\frac{20-2}{30} = \frac{18}{30} = \boxed{60\%}$ | 68. $180 + 180 - 90 = 270^\circ$ |
| 17. $18 \times 20 \text{ min} = 6 \text{ hr}$ | 42. $\frac{18}{3 \times 12} = \frac{1}{2} = \0.50 per oz | 69. 840 |
| 18. $15 \text{ min} + 55 \text{ min} + 6 \text{ hr} = 7$
$\text{hr } 10 \text{ min}$ | 43. $\frac{208}{400} = \frac{52}{100} = \frac{13}{25}$ | 70. There are $C_2^6 = 15$ games.
Each game has a winner.
$4 + 3 + 2 + 2 + 2 + \square = 15$
$\square = 2$
Monica must have won $\boxed{2}$
games.
The following is <u>an example</u>
for the outcomes of the |
| 19. $10:20 \text{ am} + 7:10 = 5:30 \text{ pm}$ | 44. $0.52 = 52\%$ | |
| 20. 54 min | 45. $\frac{3}{4} \times 120 = 90$
$\frac{2}{3} \times 120 = 80$
$90 - 80 = \boxed{10}$ | |
| 21. 106 hours | 46. $24 \times \frac{7}{8} - 6 = 15$ | |
| 22. $30 \text{ min} = \frac{1}{2} \text{ hr}$
$\frac{1}{2} \times 30 = 15 \text{ hr}$ | 47. $26 \text{ lb } 15 \text{ oz}$
$63 \text{ lb } 8 \text{ oz} - 36 \text{ lb } 9 \text{ oz} = 26$
$\text{lb and } 15 \text{ oz}$ | |
| 23. $1 \text{ hour } 59 \text{ min}$ | 48. $136 \div 16 = 8.5$ (lb) | |
| 24. $12 - 3 \times 2 = 6 \text{ am}$ | 49. $32 - 27\frac{3}{4} = 4\frac{1}{4} \text{ lb} = 4 \text{ lb } 4 \text{ oz}$ | |
| 25. $0:30 + 0:45 + 1:00 = 2:15$
$2 \text{ hours } 15 \text{ minutes} = 2\frac{1}{4}$
hours | 50. $38\frac{1}{9} - 31\frac{1}{7} = 7\frac{1}{9} - \frac{1}{7} =$
$6\frac{61}{63} \text{ pounds}$ | |
| 26. $11:35 \text{ pm}$ | 51. $576 \div 8 = 72 \text{ gal}$ | |
| 27. $4 \text{ hrs } 50 \text{ min}$ | 52. $45 \div \frac{5}{6} = 45 \times \frac{6}{5} = 54 \text{ pounds}$ | |
| 28. $20 - 15.65 + 2.25 = \$6.60$ | 53. percent increase = $\frac{\text{increase}}{\text{original price}}$
$= 40 \div 200 = 0.2 = 20\%$ | |
| 29. October 10 | | |
| 30. $7 \div 0.5 = 14 \text{ days}$ | | |
| 31. 15 weeks | | |
| 32. Randy-Sabrina
Matt-Rhonda | | |

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tournament.

	H	I	J	K	L	M
H	■	0	0	0	0	1
I	1	■	0	0	0	1
J	1	1	■	1	0	0
K	1	1	0	■	1	0
L	1	1	1	0	■	0
M	0	0	1	1	1	■
Won by column	4	3	2	2	2	2

71. See the following figure, a quarter of the 6x10 grid. The numbers of intersected cells in each column are listed right below.



#of intersected cells = $1 + 2 + 1 + 2 + 1 = 7$
 #of not intersected cells = $15 - 7 = 8$
 $4 \times 8 = \boxed{32}$

72. $3 + 12 = 15$

$8 + 12 = 20$

Zina = $\boxed{12}$

73. $180 - 20 = 160$

$\frac{1}{2}(160) = 80$ (two base angles)

$\frac{1}{2}(80) = 40$ (angle bisected)

$\angle CRT = 20 + 40 = \boxed{60}$
 (exterior angle theorem)

74. $5 \times 3 \times 4 = 60$ (original)

$7 \times 3 \times 4 = 84$

$5 \times 5 \times 4 = 100$

$5 \times 3 \times 6 = 90$

$6 \times 3 \times 5 = 90$

$6 \times 4 \times 4 = 96$

$90 - 60 = \boxed{40}$

75. $4 \times 3 + 1 = 13$

76. D

$B + E = 800$

$B + C = 900$

$A + E = 700$

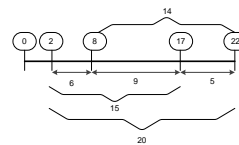
$A = 700 - E$

$B = 800 - E$

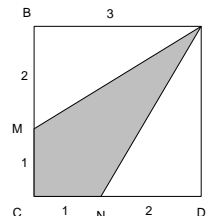
$C = E + 100$

$C + E = 2E + 100 > 1000$

77. 14



78. $\sqrt{2^2 + 3^2} = \sqrt{13}$



79. A

80. 12

Answer Key

Vocab for GT
Middle School

1. garnishes
2. hoaxes
3. businesses
4. equinoxes
5. ambushes
6. reproaches
7. excesses
8. reflexes
9. mismatches
10. quartzes
11. equinoxes
12. quartzes
13. garnishes
14. ambushes
15. reproaches
16. Excesses
17. businesses
18. reflexes
19. hoaxes
20. mismatches

Vocab for GT
Middle School

21. cliffs
22. fiefs
23. halves
24. leaves
25. reproofs
26. lives
27. serfs
28. thieves
29. yourselves
30. plaintiffs
31. plaintiffs
32. halves
33. yourselves
34. cliffs
35. leaves
36. fiefs
37. serfs
38. lives
39. thieves
40. reproofs

164. principle
165. climatic

Vocab for GT
Middle School

41. stationary
42. dissent
43. affect
44. duel
45. baron
46. descent
47. dual
48. effect
49. stationery
50. barren
51. stationary
52. descent
53. duel
54. dissent
55. dual
56. barren
57. effect
58. baron, affect
59. stationary
60. kernel
61. epic
62. epoch
63. colonel
64. excepting
65. accepting

Vocab for GT
Middle School

66. feudal
67. futile
68. faze
69. phase
70. feudal
71. idle
72. idol
73. allusion
74. illusion
75. petal
76. pedal
77. idle
78. idol
79. petal
80. faze
81. feudal

82. faze
83. futile, phase
84. Pedal
85. illusion

Analogies

86. A
87. B
88. D
89. B
90. C
91. A
92. C
93. C
94. C
95. B
96. B
97. C
98. A
99. C
100. C
101. C
102. B
103. D
104. C
105. C

Sentence
Completion

106. C
107. A
108. C
109. D
110. D
111. C
112. C
113. D
114. C
115. A
116. D
117. D
118. D
119. A
120. B
121. D
122. D
123. C

124. A

125. D

Synonym
Replacement

126. A
127. B
128. B
129. C
130. C
131. A
132. D
133. A
134. C
135. B
136. C
137. B
138. B
139. B
140. C
141. A
142. C
143. D
144. B
145. B

Confusing Words

146. ascent
147. raise
148. Complement
149. Herd
150. course
151. by
152. amoral
153. flounder
154. loose
155. Breathe
156. whom
157. Whole
158. past
159. stationary
160. bough
161. women
162. affects
163. dessert

Answer Key

Vocab for GT Middle School	Vocab for GT Middle School	Analogies	Synonym Replacement
1. idol	41. altos	79. A	119. D
2. dual	42. armadillos	80. A	120. A
3. idle	43. cargoes	81. C	121. A
4. duel	44. logos	82. C	122. B
5. baron	45. mottos	83. B	123. D
6. barren	46. torsos	84. A	124. D
7. faze	47. sopranos	85. D	125. C
8. phase	48. torpedoes	86. B	126. D
9. stationary	49. vetoes	87. A	127. D
10. feudal	50. volcanos	88. A	128. C
11. conifer	51. volcanoes	89. A	129. C
12. evoke	52. sopranos	90. D	130. B
13. describe	53. vetoes	91. A	131. B
14. transmit	54. cargoes	92. B	132. A
15. preference	55. altos	93. C	133. A
16. permissive	56. torsos	94. C	134. C
17. revoke	57. torpedoes	95. C	135. B
18. transfer	58. armadillos	96. A	136. B
19. prescription	59. logos	97. C	137. D
20. vocabulary	60. mottos	98. A	138. C
Vocab for GT Middle School	Vocab for GT Middle School	Sentence Completion	Confusing Words
21. Vocation	61. crises	99. C	139. curreant
22. Scribble	62. perpetual	100. B	140. story
23. Commit	63. homestead	101. B	141. Conscience
24. Futile	64. heritage	102. D	142. edition
25. Effect	65. long-lasting, explorer	103. B	143. broach
26. Illusion	66. curiosity	104. C	144. grisly
27. Infer	67. sighted, deliberately	105. D	145. titivate
28. Omission	68. absurd	106. C	146. Quiet
29. Dissent	69. role-model	107. B	147. allusion
30. Allusion	70. navigating	108. C	148. lay
31. Admission	71. crucial	109. B	149. buy
32. Petal	72. crisis	110. B	150. founder
33. Provoke	73. bringing	111. C	151. illicit
34. Inscribe	74. criterion	112. B	152. bow
35. Reference	75. medium	113. C	153. hoard
36. Manuscript	76. ruins	114. D	154. exercise
37. Affect	77. magnitude	115. C	155. flaunt
38. Dissent	78. theirs	116. B	156. current
39. Pedal		117. C	157. Whose
40. Stationary		118. B	158. exorcise