JEFFERSON MATH PROJECT REGENTS AT RANDOM

The NY Geometry Regents Exams
Fall 2008-August 2009
(Answer Key)

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Dear Sir

I have to acknolege the reciept of your favor of May 14. in which you mention that you have finished the 6. first books of Euclid, plane trigonometry, surveying & algebra and ask whether I think a further pursuit of that branch of science would be useful to you. there are some propositions in the latter books of Euclid, & some of Archimedes, which are useful, & I have no doubt you have been made acquainted with them. trigonometry, so far as this, is most valuable to every man, there is scarcely a day in which he will not resort to it for some of the purposes of common life. the science of calculation also is indispensible as far as the extraction of the square & cube roots; Algebra as far as the quadratic equation & the use of logarithms are often of value in ordinary cases: but all beyond these is but a luxury; a delicious luxury indeed; but not to be indulged in by one who is to have a profession to follow for his subsistence. in this light I view the conic sections, curves of the higher orders, perhaps even spherical trigonometry, Algebraical operations beyond the 2d dimension, and fluxions.

Letter from Thomas Jefferson to William G. Munford, Monticello, June 18, 1799.

Geometry Regents at Random

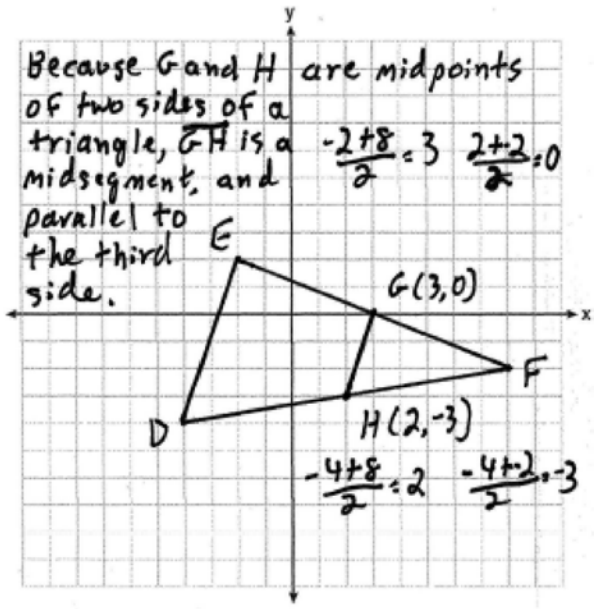
Answer Section

1. ANS: C PTS: 2 TOP: Quadratic-Linear Systems-GE
2. ANS: B PTS: 2 TOP: Chords, Secants and Tangents
3. ANS: D PTS: 2 TOP: Locus
4. ANS: D PTS: 2 TOP: Tangents
5. ANS: $2\sqrt{3}$

   PTS: 2 TOP: Similarity
6. ANS: D PTS: 2 TOP: Similarity
7. ANS: D PTS: 2 TOP: Similarity
8. ANS: B PTS: 2 TOP: Identifying Transformations
9. ANS: A PTS: 2 TOP: Interior and Exterior Angles of Triangles
10. ANS: 3

    PTS: 2 TOP: Special Quadrilaterals
11. ANS: B PTS: 2 TOP: Planes
12. ANS: A PTS: 2 TOP: Quadratic-Linear Systems-GE
13. ANS: B PTS: 2 TOP: Midpoint
14. ANS: B PTS: 2 TOP: Chords

15. ANS:



PTS: 4 TOP: Medians, Altitudes, Bisectors and Midsegments

16. ANS: D PTS: 2 TOP: Classifying Solids
17. ANS: B PTS: 2 TOP: Midpoint
18. ANS:

$y=\frac{4}{3}x-6$

PTS: 4 TOP: Slope Intercept Form of a Line

19. ANS: A PTS: 2 TOP: Special Quadrilaterals
20. ANS: C PTS: 2 TOP: Chords
21. ANS:

Contrapositive-If two angles of a triangle are not congruent, the sides opposite those angles are not congruent.

PTS: 2 TOP: Contrapositive

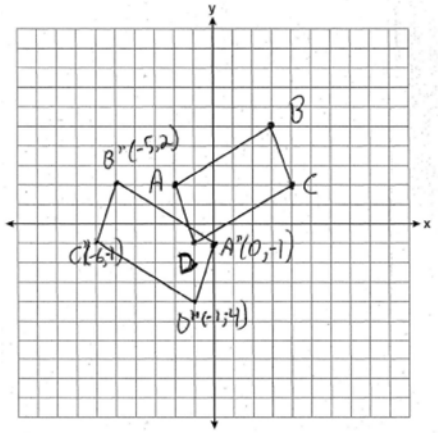
22. ANS:

25

PTS: 2 TOP: Distance

23. ANS: A PTS: 2 TOP: Finding the Center and Radius of Circles
24. ANS: C PTS: 2 TOP: Constructions
25. ANS: C PTS: 2 TOP: Tangents
26. ANS: B PTS: 2 TOP: Similarity

27. ANS:



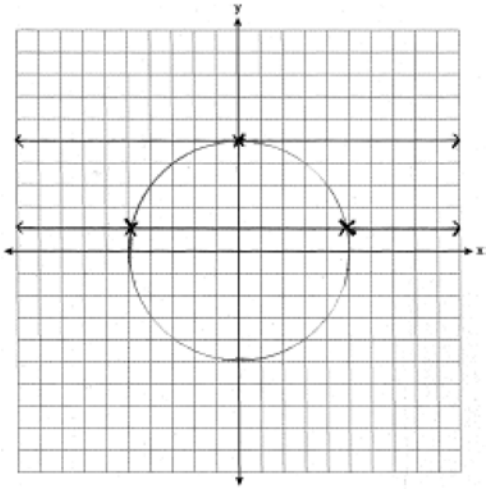
PTS: 4 TOP: Compositions of Transformations

28. ANS: A PTS: 2 TOP: Planes
29. ANS: C PTS: 2 TOP: Constructions
30. ANS: D PTS: 2 TOP: Parallel and Perpendicular Lines-GE
31. ANS: C PTS: 2 TOP: Parallel and Perpendicular Lines-GE
32. ANS:

$y = \frac{2}{3}x - 9$

PTS: 2 TOP: Parallel and Perpendicular Lines-GE

33. ANS:



PTS: 4 TOP: Locus-2

34. ANS: B PTS: 2 TOP: Chords
35. ANS:
20

PTS: 2 TOP: Medians, Altitudes, Bisectors and Midsegments

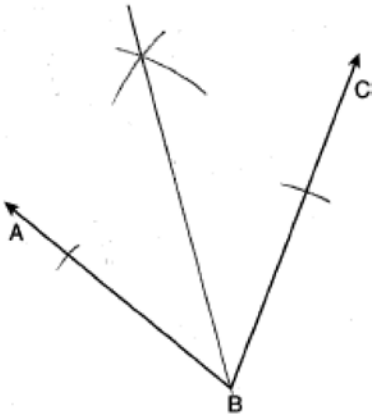
36. ANS: A PTS: 2 TOP: Equations of Circles

37. ANS: A PTS: 2 TOP: Constructions
38. ANS: A PTS: 2 TOP: Volume-GE
39. ANS: C PTS: 2 TOP: Constructions
40. ANS:
$y = -2x + 14$

PTS: 2 TOP: Parallel and Perpendicular Lines-GE
41. ANS: B PTS: 2 TOP: Equations of Circles
42. ANS: A PTS: 2 TOP: Identifying Transformations
43. ANS: A PTS: 2 TOP: Similarity Proofs
44. ANS:
$15 + 5\sqrt{5}$

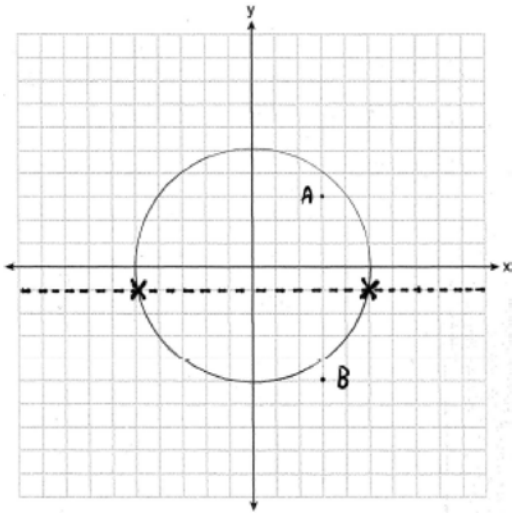
PTS: 4 TOP: Perimeter
45. ANS: D PTS: 2 TOP: Contrapositive
46. ANS: C PTS: 2 TOP: Logical Reasoning
47. ANS: C PTS: 2 TOP: Special Quadrilaterals
48. ANS: A PTS: 2 TOP: Special Quadrilaterals
49. ANS:
26

PTS: 2 TOP: Interior and Exterior Angles of Triangles
50. ANS: C PTS: 2 TOP: Equations of Circles
51. ANS:



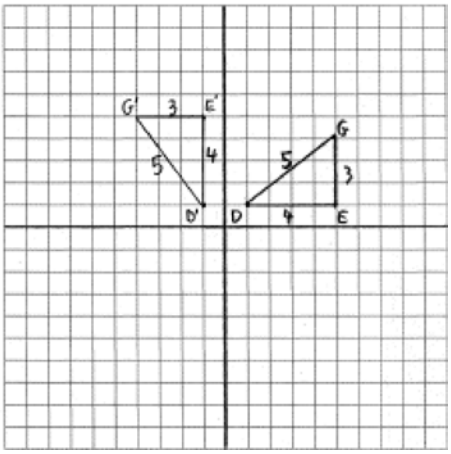
PTS: 2 TOP: Constructions
52. ANS: A PTS: 2 TOP: Compositions of Transformations
53. ANS: B PTS: 2 TOP: Parallel and Perpendicular Lines-GE
54. ANS: D PTS: 2 TOP: Planes
55. ANS: D PTS: 2 TOP: Translations
56. ANS: A PTS: 2 TOP: Equations of Circles

57. ANS:



PTS: 4 TOP: Locus

58. ANS: D PTS: 2 TOP: Triangle Inequalities
59. ANS: D PTS: 2 TOP: Identifying Transformations
60. ANS: B PTS: 2 TOP: Medians, Altitudes, Bisectors and Midsegments
61. ANS:



$D'(-1,1)$, $E'(-1,5)$, $G'(-4,5)$

PTS: 4 TOP: Rotations

62. ANS: C PTS: 2 TOP: Medians, Altitudes, Bisectors and Midsegments
63. ANS: B PTS: 2 TOP: Parallel and Perpendicular Lines-GE
64. ANS:
2016

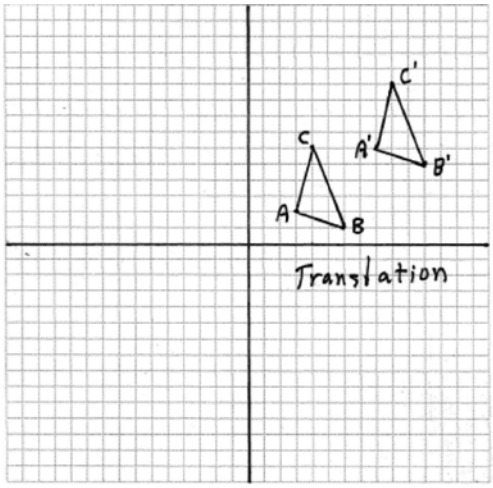
PTS: 2 TOP: Volume-GE

65. ANS: D PTS: 2 TOP: Special Quadrilaterals
66. ANS: D PTS: 2 TOP: Angles Involving Parallel Lines

67. ANS:
20

PTS: 2 TOP: Similarity

68. ANS: B PTS: 2 TOP: Chords
69. ANS: D PTS: 2 TOP: Midpoint
70. ANS: C PTS: 2 TOP: Congruency Proofs
71. ANS: D PTS: 2 TOP: Quadratic-Linear Systems-GE
72. ANS:



PTS: 2 TOP: Identifying Transformations

73. ANS: C PTS: 2 TOP: Congruency Proofs
74. ANS: A PTS: 2 TOP: Distance
75. ANS: D PTS: 2 TOP: Constructions
76. ANS: D PTS: 2 TOP: Medians, Altitudes, Bisectors and Midsegments
77. ANS:
$\angle D$, $\angle G$ and 24° or $\angle E$, $\angle F$ and 84°

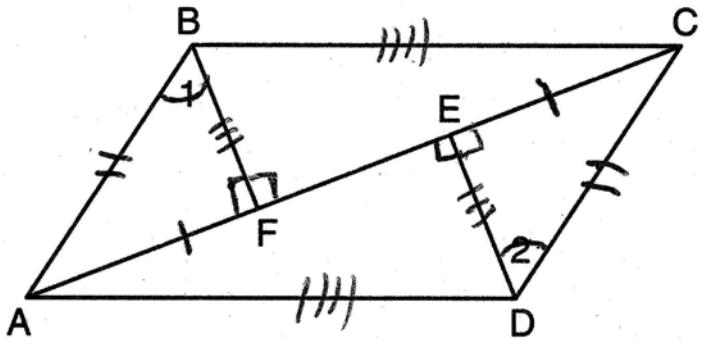
PTS: 4 TOP: Chords

78. ANS:
True. The first statement is true and the second statement is false. In a disjunction, if either statement is true, the disjunction is true.

PTS: 2 TOP: Logical Reasoning

79. ANS: B PTS: 2 TOP: Parallel and Perpendicular Lines-GE

80. ANS:



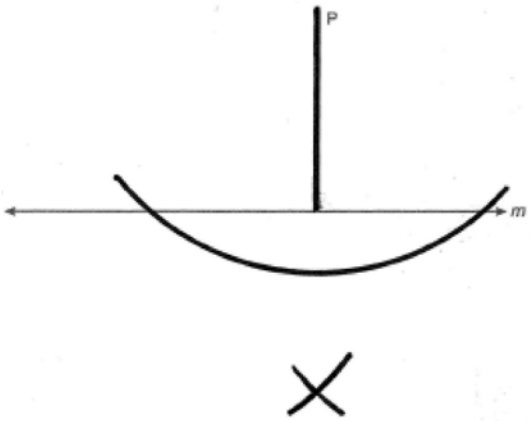
$\overline{FE} \cong \overline{FE}$ (Reflexive Property); $\overline{AE} - \overline{FE} \cong \overline{FC} - \overline{EF}$ (Angle Subtraction Theorem); $\overline{AF} \cong \overline{CE}$ (Substitution); $\angle BFA \cong \angle DEC$ (All right angles are congruent); $\triangle BFA \cong \triangle DEC$ (AAS); $\overline{AB} \cong \overline{CD}$ and $\overline{BF} \cong \overline{DE}$ (CPCTC); $\angle BFC \cong \angle DEA$ (All right angles are congruent); $\triangle BFC \cong \triangle DEA$ (SAS); $\overline{AD} \cong \overline{CB}$ (CPCTC); $ABCD$ is a parallelogram (opposite sides of quadrilateral $ABCD$ are congruent)

PTS: 6 TOP: Quadrilateral Proofs

81. ANS: A PTS: 2 TOP: Interior and Exterior Angles of Triangles
82. ANS: D PTS: 2 TOP: Logical Reasoning
83. ANS:
18

PTS: 4 TOP: Tangents

84. ANS: A PTS: 2 TOP: Classifying Triangles
85. ANS: B PTS: 2 TOP: Parallel and Perpendicular Lines-GE
86. ANS: A PTS: 2 TOP: Translations
87. ANS: D PTS: 2 TOP: Interior and Exterior Angles of Other Polygons
88. ANS:



PTS: 2 TOP: Constructions

89. ANS: A PTS: 2 TOP: Volume-GE
90. ANS: D PTS: 2 TOP: Equations of Circles
91. ANS: B PTS: 2 TOP: Writing Equations of Circles
92. ANS: C PTS: 2 TOP: Planes

93. ANS:
$\overline{AC}$

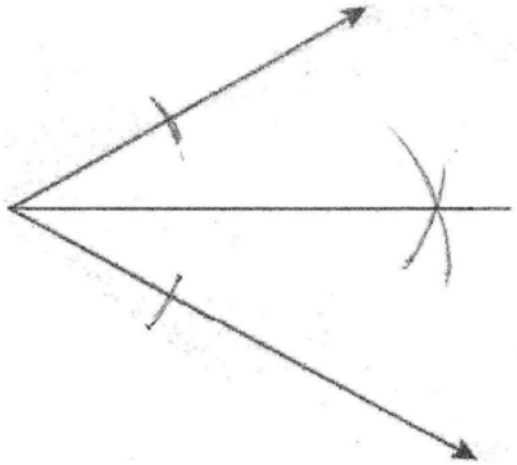
PTS: 2 TOP: Interior and Exterior Angles of Triangles
94. ANS: C PTS: 2 TOP: Classifying Solids
95. ANS: A PTS: 2 TOP: Compositions of Transformations
96. ANS: C PTS: 2 TOP: Medians, Altitudes, Bisectors and Midsegments
97. ANS: D PTS: 2 TOP: Isosceles Triangles
98. ANS: D PTS: 2 TOP: Perimeter, Area and Volume of Similar Figures
99. ANS: B PTS: 2 TOP: Pythagoras-GE
100. ANS: C PTS: 2 TOP: Compositions of Transformations
101. ANS: C PTS: 2 TOP: Chords, Secants and Tangents
102. ANS: C PTS: 2 TOP: Planes
103. ANS:
Because $\overline{AB} \parallel \overline{DC}$, $\overset{\frown}{AD} \cong \overset{\frown}{BC}$ since parallel chords intersect congruent arcs. $\angle BDC \cong \angle ACD$ because inscribed angles that intercept congruent arcs are congruent. $\overline{AD} \cong \overline{BC}$ since congruent chords intersect congruent arcs. $\overline{DC} \cong \overline{CD}$ because of the reflexive property. Therefore, $\triangle ACD \cong \triangle BDC$ because of SAS.

PTS: 6 TOP: Circle Proofs
104. ANS: A PTS: 2 TOP: Volume-GE
105. ANS:
$\overline{AC} \cong \overline{EC}$ and $\overline{DC} \cong \overline{BC}$ because of the definition of midpoint. $\angle ACB \cong \angle ECD$ because of vertical angles. $\triangle ABC \cong \triangle EDC$ because of SAS. $\angle CDE \cong \angle CBA$ because of CPCTC. $\overline{BD}$ is a transversal intersecting $\overline{AB}$ and $\overline{ED}$. Therefore $\overline{AB} \parallel \overline{DE}$ because $\angle CDE$ and $\angle CBA$ are congruent alternate interior angles.

PTS: 6 TOP: Congruency Proofs
106. ANS:
22.4

PTS: 2 TOP: Volume-GE
107. ANS: B PTS: 2 TOP: Interior and Exterior Angles of Triangles
108. ANS: C PTS: 2 TOP: Reflections
109. ANS: B PTS: 2 TOP: Planes
110. ANS: B PTS: 2 TOP: Triangle Inequalities
111. ANS: A PTS: 2 TOP: Similarity

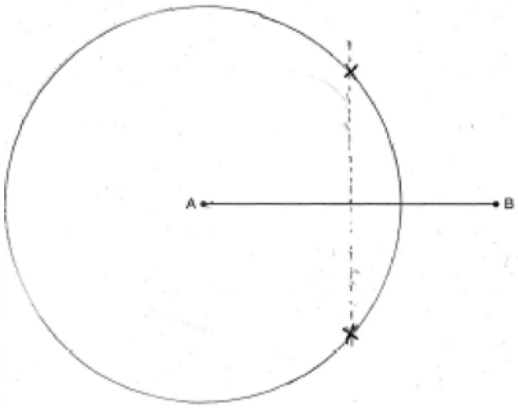
112. ANS:



PTS: 2 TOP: Constructions

113. ANS: D PTS: 2 TOP: Medians, Altitudes, Bisectors and Midsegments

114. ANS:



PTS: 2 TOP: Locus