

IM1H Book 1 Selected Answers

IM1H Dream Team

September 30, 2025

1. (a) $A_{ABCD} = 25$, $A_{BCEF} = 9$
(b) –
(c) –
(d) $A = 34$
(e) $l = \sqrt{34}$
(f) –
2. $l = 4\sqrt{5}$
3. Yes
4. –
5. –
6. $AB = \sqrt{41}$
7. $l = 5\sqrt{2}$
8. $l = \sqrt{5}$, No
9. 12
10. $(12, 2), (2, 2)$
11. No
12. $d = 10\sqrt{2}$
13. (a) $C = (5, 0)$. Answers may vary.
(b) $D = (5, 1)$. Answers may vary.
(c) $x = 5$
(d) –
14. (a) 13, 17, 13, 17
(b) –

15. (a) $AP = BP = 2\sqrt{5}$
 (b) $(3, 5), (2, 2), (4, 8)$. Answers may vary.
 (c) No
 (d) $y = 3(x - 2) + 2$
16. $(10, 3), (-6, 3)$
17. $-$
18. (a) $(0, 0), (6, 0)$. Answers may vary.
 (b) $(0, 4), (4, 2)$. Answers may vary.
 (c) $(0, 4), (2, 2)$. Answers may vary.
19. $AB = BC = \sqrt{10}$
20. $C = (6, 3)$. Infinite. Answers may vary for C .
21. $(0, 0), (\sqrt{13}, 0)$. Answers may vary.
22. $(0, 0), (2, 3)$
23. $(0, 0), (\sqrt{13}, 0), (2 + \sqrt{13}, 3), (\sqrt{13}, 6), (0, 6), (-2, 3)$. Answers may vary.
24. $24 - 12\sqrt{2}, 24\sqrt{2} - 24$
25. There are an infinite number of different ways.
26. 208m
27. $AP = BP = 5\sqrt{2}$.
 2 more equidistant points: $Q = (2, 2), R = (5, 3)$. Answers may vary.
 All equidistant points: $y = \frac{1}{3}(x - 2) + 2$.
28. Short leg: $21 - 7\sqrt{5}$
 Long leg: $42 - 14\sqrt{5}$
 Hypotenuse: $21\sqrt{5} - 35$
29. $\frac{5}{12}$
30. $(0, 5 + 4\sqrt{2}), (0, 5 - 4\sqrt{2})$
31. (a) $(0, 0), (4, 1)$. Answers may vary.
 (b) No.
32. Yes.
33. (a) Yes.
 (b) \overline{KL}
 (c) $\angle KLM$

- (d) $\angle BAC$
 (e) They're congruent.
34. They sum to 90° .
35. It's a right angle.
36. (a) $-$
 (b) $\frac{b}{a}$ is the negative reciprocal of $\frac{-a}{b}$.
37. $-$
38. $-$
39. A line with an undefined slope is perfectly vertical while a line with a slope of 0 is perfectly horizontal.
40. $n = \frac{49}{4}$
41. $x = 1$. Answers may vary.
42. $y = 1$. Answers may vary.
43. They're the same line. $-50x + 30y = 90$.
44. $-$
45. No.
46. (a) $y = \frac{1}{2}(x - 5) + 5$
 (b) $4x - 5y = 8$
47. Yes.
48. $(\frac{15}{8}, \frac{15}{8})$
49. $m = -1$
50. Yes.
51. (a) $-$
 (b) $\angle Q$; CPTC
52. $\triangle ACT \cong \triangle ION$
 $\triangle ATC \cong \triangle INO$
 $\triangle CAT \cong \triangle OIN$
 $\triangle CTA \cong \triangle ONI$
 $\triangle TAC \cong \triangle NIO$
 $\triangle TCA \cong \triangle NOI$

53. $\triangle BAL \cong \triangle GEL$
 $\triangle ELB \cong \triangle ALG$
 $\triangle GEA \cong \triangle BAE$
 $\triangle ABG \cong \triangle EGB$
54. $\angle ABC$ or $\angle CBA$ or $\angle B$ (different ways of writing the same thing).
55. \overline{AB}
56. (a) $PNMRQ$
(b) $\angle Q$
57. (a) $d_{AP} = \sqrt{(x+1)^2 + (y-5)^2}$
(b) $d_{BP} = \sqrt{(x-5)^2 + (y-2)^2}$
(c) $\sqrt{(x+1)^2 + (y-5)^2} = \sqrt{(x-5)^2 + (y-2)^2}$
(d) $4x - 2y = 1$
(e) $(2, 3.5)$
(f) $m_{AB} = -\frac{1}{2}$; $m_P = 2$
(g) —
58. (a) The distance between (x, y) and $(3, 5)$ is equal to the distance between (x, y) and $(7, -1)$.
(b) $2x - 3y = 4$
59. (a) —
(b) —
(c) $(6, 9.5)$
(d) $(6.2, 9.8)$
60. (a) $10x - 8y = -35$
(b) $(4.5, 10)$. Answers may vary.
(c) $\overline{PA} = \overline{PB}$
61. (a) $(21, 16)$
(b) $(30, 22)$
(c) $(3 + 3t, 4 + 2t)$
62. —
63. $x = 1 + t$; $y = 2 + 3t$. Answers may vary.
64. $(-3.5, -0.5)$
65. $(0, 16.9)$

66. (a) –
 (b) $\frac{\Delta y \text{ from a 1 unit increase in } t}{\Delta x \text{ from a 1 unit increase in } t}$
 (c) $y = \frac{11}{3} + \frac{2}{3}x$
67. –
68. (a) $[7, 2]$
 (b) $[14, 8]$
 (c) $[-7, -4]$
 (d) $[7, 4]$
69. (a) $[3, 6]$
 (b) $[3, -2]$
 (c) $[-100, 40]$
70. (a) 12 miles east and 16 miles north
 (b) 20 miles
 (c) 10 miles/hour
71. (a) 48 miles
 (b) 4.8 hours
 (c) 14.4 miles east and 19.2 miles north of his departure point.
72. (a) $A' = (6, 5)$, $B' = (8, -2)$, $C' = (11, 4)$
 (b) $B'' = (-1, 0)$, $C'' = (2, 6)$
73. $K' = (5, 3)$, $L' = (9, 0)$, $M' = (6, -4)$. Each vertex slides $\sqrt{29}$.
74. It depends on whether the triangle is supposed to be right.
75. (a) 5 units/second
 (b) $[3, 4]$
 (c) $(-3 + 3t, 1 + 4t)$
 (d) $\frac{4}{3}$
76. Yes, yes, yes, no.
77. (a) $[4, -12]$
 (b) $[-4, 12]$
78. $(a + 2, b - 4)$
79. Answers may vary. $(0, 0)$, $(7, 1)$, $(12, 6)$, $(5, 5)$
80. (a) 132 miles east and 110 miles north

(b) $(-3 + 90t, 5 + 70t)$

81. $[8, 06]$

82. —

83. —

84. (a) —

(b) —

(c) SSA doesn't always imply congruence because in scenarios like (b) there are two incongruent triangles that satisfy SSA.

85. —

86. —

87. —

88. —

89. —

90. —