

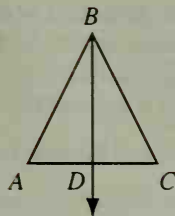
15. Given: \overrightarrow{BD} bis. $\angle ABC$; $\overrightarrow{BD} \perp \overrightarrow{AC}$

Prove: $\triangle ABC$ is isos.

Key steps of proof: 1. $\triangle ABD \cong \triangle CBD$ (ASA)

2. $\overline{AB} \cong \overline{CB}$ (CPCT)

17. Plan for proof: Show that the slopes of the bases = 0, and that the slope of the median = 0.

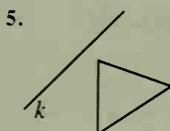
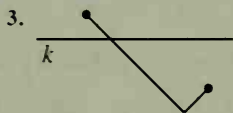


Chapter 14

Written Exercises, Pages 574–576

1. 33, 4 3. 10, 10; no 5. a. $A'(4, 2)$, $B'(8, 4)$, $C'(6, -2)$ b. Yes c. (8, 8) 7. a. $A'(0, 12)$, $B'(12, 18)$, $C'(6, 0)$ b. No c. (4, 2) 9. a. $A'(12, 4)$, $B'(8, 6)$, $C'(10, 0)$ b. Yes c. (0, 6)
11. a. Yes b. preserves c. No 13. Let X be int. of \overline{AC} and \overline{DB} . P on \overline{DC} maps to pt. P' , where \overrightarrow{PX} int. \overline{AB} . Not an isom. 15. $A'(5, 3)$, $B'(7, 3)$, $C'(9, 5)$, $D'(7, 5)$. Area $ABCD = 4$, perimeter $ABCD = 8$; Area $A'B'C'D' = 4$, perimeter $A'B'C'D' = 4 + 4\sqrt{2}$ 17. Yes 19. No 21. If A and B are diff. pts., $AB > 0$. But $A'B' = 0$. 23. a. $A'(-6, 1)$, $B'(-3, 4)$, $C'(-1, -3)$

Written Exercises, Pages 580–582



7. a. (2, -4) b. (-2, 4)
c. (4, 2) 9. a. (0, 2)
b. (0, -2) c. (-2, 0)
11. a. (-3, 2) b. (3, -2)
c. (-2, -3)

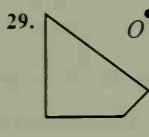
13. Examples: WOW, AHA. 15. An isos. \triangle with m the \perp bis. of the base. 17. If P is not on plane X , then X is \perp to and bis. $\overrightarrow{PP'}$. If P is on plane X , $P' = P$. 19. Let X and Y be the pts. where $\overrightarrow{PP'}$ and $\overrightarrow{QQ'}$ int. m , resp. $\triangle XYQ \cong \triangle XYQ'$, so $XQ = XQ'$ and $\angle QXY \cong \angle Q'XY$. Then $\angle PXQ \cong \angle P'XQ'$ and since $XP = XP'$, $\triangle XPQ \cong \triangle XP'Q'$ by SAS. Then $PQ = P'Q'$. 21. Const. k , the \perp to t through A , int. t at P ; const. $\overrightarrow{PA'}$ on k so that $AP = PA'$; $A' = R_t(A)$. 23. Yes 25. Path from B to H hits walls first at X , then at Y . Because reflect. is isom., $YH = YH'$, $XH' = XH''$. Thus $BX + XY + YH = BX + XY + YH' = BX + XH' = BX + XH'' = BH''$. 27. Aim for image of hole under reflect. in two walls, as in Ex. 25. 29. Yes
31. $y = -x - 5$ 33. $x = 2$ 35. $y = x$ 37. $y = -\frac{5}{3}x + 6$ 39. a. (6, 3) b. (10, -2)
c. (13, 1) d. (10 - x, y)

Written Exercises, Pages 586–587

1. a. $A'(-4, 6)$, $B'(-2, 10)$, $C'(1, 5)$; yes c. Yes; yes 3. (8, 4) 5. (-4, -3) 7. $A'(1, 4)$, $B'(4, 6)$, $C'(5, 10)$; $A''(-1, 4)$, $B''(-4, 6)$, $C''(-5, 10)$ 9. $(-x, y + 4)$ 11. a, b, c, d
13. $(x - 4, y + 9)$ 15. a. $A'(2, -2)$, $B'(3, 2)$ b. \square ; $10 + 2\sqrt{17}$ 17. The midpts. of $\overline{AA'}$, $\overline{BB'}$, and $\overline{CC'}$ lie on the reflecting line. 19. Let translation T map P to P' and Q to Q' . Let reflection R_k map P' to P'' and Q' to Q'' . Since T and R_k are isom., $PQ = P'Q'$ and $P'Q' = P''Q''$. By trans. $PQ = P''Q''$, so the glide reflection is also an isom.

Written Exercises, Pages 590–592

- Answers may vary in Exs. 1–5. 1. $R_{O, 440}$ 3. $R_{A, 90}$ 5. $R_{O, 180}$ 7. C 9. E 11. D 13. D
15. rotation 17. half-turn 19. rotation 21. reflection 23. 6 25. a, b, c, d
- 27.



31. Const. the \perp bis. of $\overline{AA'}$ and $\overline{BB'}$. They int. at O .

33. b. $A'(3, 0)$, $B'(1, -4)$ c. slope of $\overrightarrow{AB} = -\frac{1}{2}$, slope of $\overrightarrow{A'B'} = 2$;
the lines are \perp d. A rotation is an isom. e. An isom. maps any \triangle
to a $\cong \triangle$. f. $(y, -x)$