Answer Key

Lesson 9.1

Practice Level C

1. $B'(-1, 10)$ **2.** $D'(-6, 13)$ **3.** $F(2, -12)$

4. $H(12, -13)$ **5.** $J'(-5, 10)$ **6.** $K(1, -2)$

7. $(x, y) \rightarrow (x - 1, y + 1)$ **8.** $(x, y) \rightarrow (x, y - 3)$

9. $(x, y) \rightarrow (x - 7, y - 4)$

10. $(x, y) \rightarrow (x + 10, y + 8)$

11. $(x, y) \rightarrow (x + 5, y + 2)$

12. $(x, y) \rightarrow (x - 7, y - 2)$ **13.** $\overrightarrow{MT}$; $\langle 4, 2 \rangle$

14. $\overrightarrow{JD}$; $\langle 5, -1 \rangle$ **15.** $\overrightarrow{RS}$; $\langle 0, -4 \rangle$

16. $\langle -3, 1 \rangle$; $B'(3, 3)$, $C'(0, -1)$

17. $\langle -4, -7 \rangle$; $A'(-6, -3)$, $C'(-1, -9)$

18. $\langle -7, -3 \rangle$; $A'(-9, 1)$, $B'(-1, -1)$

19. $\langle 2, 4 \rangle$; $A'(0, 8)$, $C'(5, 2)$

20. true; *Sample answer:* Let $P = (a, b)$ and $Q = (c, d)$.
Then $P' = (a + h, b + k)$ and $Q' = (c + h, d + k)$. Then $PP' = QQ' = \sqrt{h^2 + k^2}$, so $\overline{PP'}$ and $\overline{QQ'}$ are congruent. Also, both $\overline{PP'}$ and $\overline{QQ'}$ have slope $\frac{k}{h}$ (or undefined slope, if $h = 0$), so they are parallel (or collinear).

21. false: *Sample answer:* Consider a rotation about the origin, where P is $(2, 0)$ and Q is $(-2, 0)$. Then $\overline{PP'}$ and $\overline{QQ'}$ are parallel and congruent, but the isometry is not a translation.

22. $\langle 2, 4 \rangle$, $\langle 5, 2 \rangle$, $\langle 3, -1 \rangle$ **23.** about 13.02 km

24. $\langle 10, 5 \rangle$; about 11.2 km

25. h is a multiple of 90; k is a multiple of 50.