Warm Up 55

1. similar
2. SAS Triangle Similarity,
3. AA Triangle Similarity,
4. SSS Triangle Similarity

Lesson Practice 55

a. $x = 24$; $y = 8$

b.

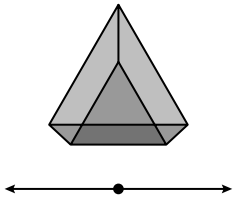
Statements	Reasons
1. $\overline{DE} \parallel \overline{BC}$	1. Given
2. $\angle ABC \cong \angle ADE$	2. Corresponding angles are congruent.
3. $\angle A \cong \angle A$	3. Reflexive Property of Congruence
4. $\triangle ABC \sim \triangle ADE$	4. AA Triangle Similarity Postulate
5. $AD = DB$	5. Definition of midpoint
6. $AD + DB = AB$	6. Segment Addition Postulate
7. $AD + AD = AB$	7. Substitute.
8. $AD = \frac{1}{2}AB$	8. Simplify.
9. $AE = \frac{1}{2}AC$	9. Corresponding parts of similar triangles are proportional.
10. $2AE = AC$	10. Multiplication Property of Equality
11. $AE + EC = AC$	11. Segment Addition Postulate
12. $AE + EC = 2AE$	12. Substitute.
13. $EC = AE$	13. Subtraction Property of Equality
14. E is the midpoint of AC	14. Definition of midpoint

c. $D(0, 1.5)$, $E(2, 3)$

d. 20

e. 27 m

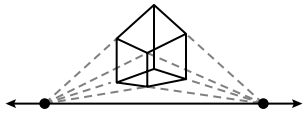
Practice 55

1. 

2. C

3. Sample: He could check that the alternate interior angles made by the crossbeams are congruent.

4. Ken's theorem would not exclude the possibility that the sum of two sides were equal to the third side, a situation that would not produce a triangle. Therefore, he is incorrect.

5. 

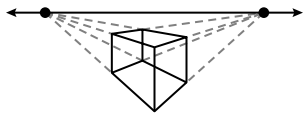
6. square

7. 12

8. Since the maximum length of the trip back to her starting point would be 625 km, she has more than enough fuel to get back.

9. Let $\triangle ABC$ be equiangular. By definition, $\angle B \cong \angle C$. By the Converse of the Isosceles Triangle Theorem, $\triangle ABC$ is isosceles with legs $\overline{AB}$ and $\overline{AC}$. By the definition of isosceles triangles, $\overline{AB} \cong \overline{AC}$. Similarly, since $\angle A \cong \angle B$, $\overline{AC} \cong \overline{BC}$. By the Transitive Property of Congruence, $\overline{AB} \cong \overline{BC}$. By definition, $\triangle ABC$ is equilateral.

10. 95.5 yd

11. 

12. $D(-1, 0.5)$; $E(1.5, 0)$

13. $m\angle S = 39°$, by the Triangle Sum Theorem, $m\angle V = 39°$, so $\angle S \cong \angle V$, so $\triangle QRS \sim \triangle TUV$ by Angle-Angle Similarity.

14. 22.5°, 90°, 112.5°, and 135°, respectively

15. $x = 15$; $y = 21$

16. $(-2, -9)$

17. 2.2

18.

Statements	Reasons
$2(x + 3) = \frac{5x - 1}{3}$	Given
$3(2(x + 3)) = 3\left(\frac{5x - 1}{3}\right)$	Multiplication Property of Equality
$6x + 18 = 5x - 1$	Simplify.
$6x + 18 - 5x - 18$ $= 5x - 1 - 5x - 18$	Subtraction Property of Equality
$x = -19$	Simplify.

19. $y = \pm 4\sqrt{3}$

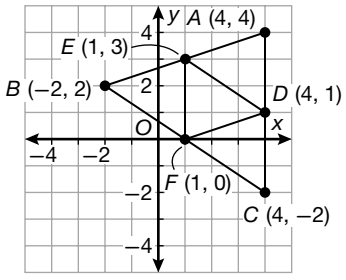
20. Sample: On $\triangle ABC$, consider altitude $\overline{AD}$ with D on $\overline{BC}$. By the Isosceles Triangle Theorem, $m\angle B = m\angle C$, and since $\angle BDA$ is a right angle, by the HA Theorem, $\triangle ABD \cong \triangle ACD$. By CPCTC, $\overline{BD} \cong \overline{DC}$, so D is the midpoint of $\overline{BC}$. Therefore, $\overline{AD}$ is also the median.

21. $AC + DC = AD$ by the Segment Addition Postulate. So $\angle 1 \cong \angle 2$ by the Isosceles Triangle Theorem, and by the definition of congruent angles, $m\angle 1 = m\angle 2$. $m\angle ABD = m\angle 2 + m\angle 3$ by the Angle Addition Postulate, so by the Comparison Property of Inequality, $m\angle ABD > m\angle 2$. By substitution, $m\angle ABD > m\angle 1$. Since in a triangle, the longer side is opposite the larger angle, $AD > AB$. By substitution, $AC + DC > AB$, and by further substitution, $AC + BC > AB$.

22. 2.2 inches

23. 160°

24.



25. 212 miles

26. 25,312.5 ft^2

27. $\angle M \cong \angle L$, $KL : MN = JL : JM$, so $\triangle JKL \sim \triangle JNM$ by SAS Similarity.

28. 4.1

29. The situation is impossible because when parallel lines are intersected by a transversal, same-side interior angles are supplementary.

30. 9