Name _____ Date _____

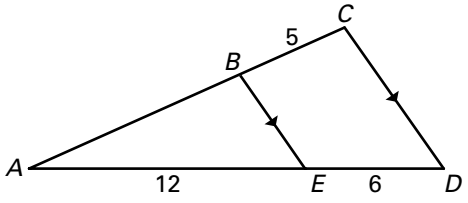
LESSON 6.6

Practice A

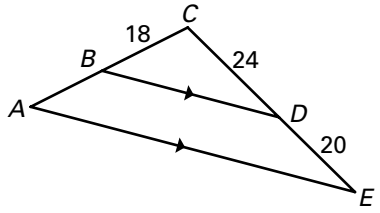
For use with pages 414–421

Find the length of $\overline{AB}$.

1.



2.



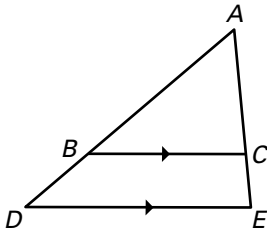
Determine whether the statement is *true* or *false. Explain* your reasoning.

3. $\frac{AB}{BD} = \frac{AC}{CE}$

4. $\frac{AC}{CE} = \frac{BC}{DE}$

5. $\frac{EC}{CA} = \frac{ED}{CB}$

6. $\frac{DB}{BA} = \frac{EC}{CA}$



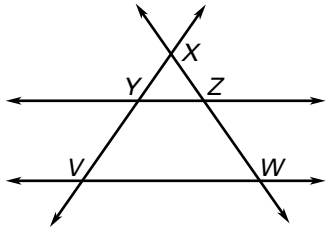
Use the given information to determine whether $\overline{YZ} \parallel \overline{VW}$. If so, state the reason.

7. $\frac{XY}{XV} = \frac{XZ}{XW}$

8. $\frac{XY}{YV} = \frac{XZ}{ZW}$

9. $\triangle XYZ \sim \triangle XVW$

10. $\angle VYZ \cong \angle WZY$



Use the figure to match the segment with its length.

11. $\overline{GF}$

12. $\overline{FC}$

13. $\overline{ED}$

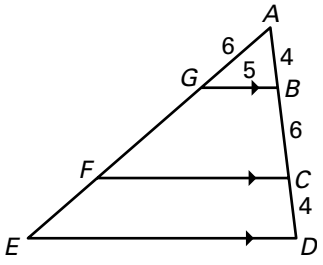
14. $\overline{FE}$

A. 9

B. 12.5

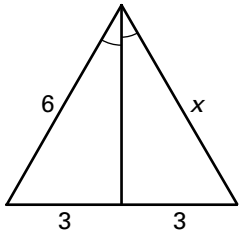
C. 6

D. 17.5

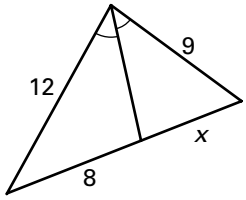


Find the value of *x*.

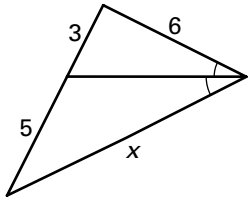
15.



16.



17.



Name _____ Date _____

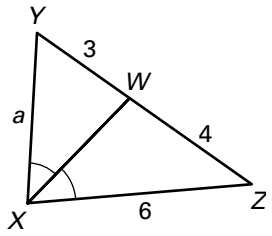
LESSON 6.6

Practice A *continued*

For use with pages 414–421

Find the value of the variable.

18.



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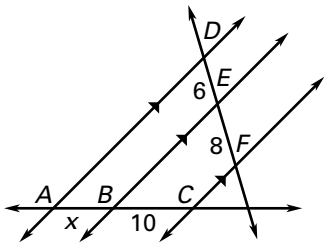
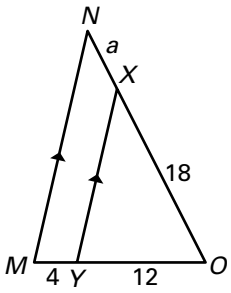
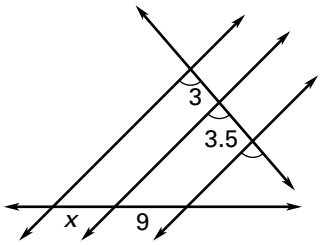


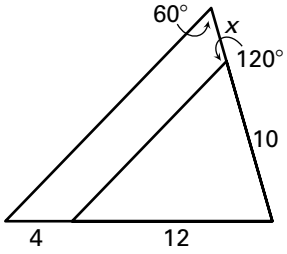
20.



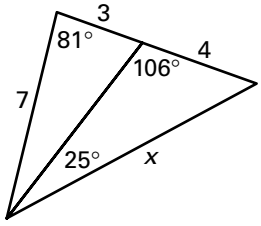
21.



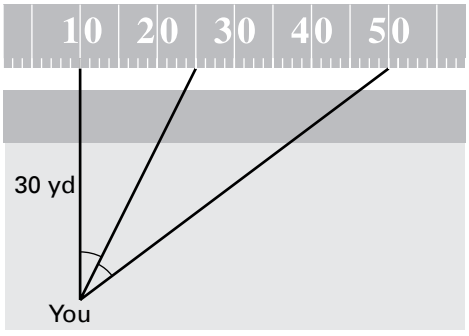
22.



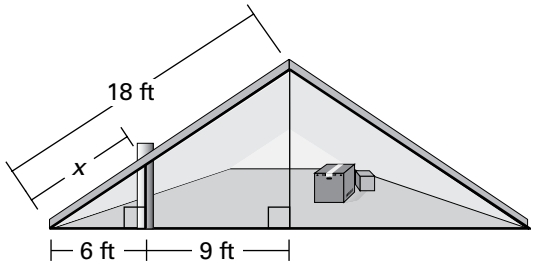
23.



24. Stadium Seats Your seat at a football game is directly in front of the 10-yard line, 30 yards from the field. Your position forms congruent angles with the 10-yard line, the 25-yard line, and the 50-yard line as shown in the figure. How far are you from where the 50-yard line intersects the sideline?



25. House Design The figure is a diagram of a cross section of the attic of a house. A vent pipe comes through the floor 6 feet from the edge of the house. What is the distance x on the roof, from the edge of the roof to the vent pipe?



Lesson 6.5, continued

14. $10 + \sqrt{69}$ **15.** $\triangle ABD \sim \triangle GFD$, $\triangle CBD \sim \triangle EFD$, $\triangle ACD \sim \triangle GED$

16. $x = 10, y = 5$ **17.** $x = 76, y = 5$

18. $x = 8, y = 4, z = 2\frac{1}{3}$

19. *Sample answer:* You are given that $\triangle ABC$ is equilateral, so $AB = BC = AC$ by the definition of an equilateral $\triangle$. It is given that $\overline{DE}$, $\overline{DF}$, and $\overline{EF}$ are midsegments, so $DE = \frac{1}{2}BC$, $EF = \frac{1}{2}AC$, and $DF = \frac{1}{2}AB$ by the midsegment Thm. Then $DE = \frac{1}{2}BC$, $EF = \frac{1}{2}BC$, and $DF = \frac{1}{2}BC$ by the Substitution Property of Equality and $DE = EF = DF$ by the Transitive Property, so the segments are congruent by definition. Therefore, $\triangle ABC \sim \triangle FED$ by the SSS Similarity Thm.

20. *Sample answer:* Because you are given that $\overline{OG}$ is a median of $\triangle PGR$ and $\overline{SU}$ is a median of $\triangle TUV$, O is the midpoint of $\overline{PR}$ and S is the midpoint of $\overline{TV}$. Then, $PR = 2PO$ and $TV = 2TS$. So, $\frac{PR}{TV} = \frac{2PO}{2TS} = \frac{PO}{TS}$. Because $\triangle PQR \sim \triangle TUV$, $\frac{PG}{TU} = \frac{PR}{TV}$. So, by the Transitive Property of Equality, $\frac{PG}{TU} = \frac{PO}{TS}$. Because $\triangle PQR \sim \triangle TUV$, $\angle P \cong \angle T$. Then $\triangle OPG \sim \triangle STU$ by SAS. Therefore, $\frac{OG}{SU} = \frac{PR}{TV}$.

21. a. AA Similarity Post. **b.** 36 ft **c.** $41\frac{1}{3}$ in.

Review for Mastery

1. $\triangle EFG \sim \triangle LMN$ **2.** 9 **3.** 6

Challenge Practice

1. $\triangle DEF \sim \triangle QRP$; $\frac{EF}{RP} = \frac{DE}{QR} = \frac{FD}{PQ} = \frac{4}{3}$, triangles are similar by the SSS Similarity Theorem; $\frac{4}{3}$

2. $\triangle RST \sim \triangle WVT$; $\frac{ST}{VT} = \frac{RT}{WT} = \frac{2}{5}$, $\angle STR \cong \angle VTW$, triangles are similar by the SAS Similarity Theorem; $\frac{2}{5}$

3. $AB = \sqrt{45} = 3\sqrt{5}$, $DE = \sqrt{20} = 2\sqrt{5}$, $BC = \sqrt{90} = 3\sqrt{10}$, $EF = \sqrt{40} = 2\sqrt{10}$, $CA = \sqrt{117} = 3\sqrt{13}$, $FD = \sqrt{52} = 2\sqrt{13}$, $\frac{AB}{DE} = \frac{BC}{EF} = \frac{CA}{FD} = \frac{3}{2}$; $\triangle ABC \sim \triangle DEF$ by the SSS Similarity Theorem; $\frac{3}{2}$

4.

Statements	Reasons
1. $\overline{AH} \parallel \overline{CF}$ and $\overline{CA} \parallel \overline{FH}$	**1.** Given
2. $\angle AHC \cong \angle FCH$	**2.** Alternate Interior Angles Theorem
3. $\angle ACH \cong \angle FHC$	**3.** Alternate Interior Angles Theorem
4. $\angle DKC \cong \angle JKH$	**4.** Vertical Angles Congruence Theorem
5. $\triangle DKC \sim \triangle JKH$	**5.** AA Similarity Postulate
6. $\frac{DK}{JK} = \frac{KC}{KH} = \frac{DC}{JH}$	**6.** All sides of similar triangles are proportional.
7. $\angle CKB \cong \angle HKG$	**7.** Vertical Angles Congruence Theorem
8. $\triangle CKB \sim \triangle HKG$	**8.** AA Similarity Postulate
9. $\frac{CK}{HK} = \frac{KB}{KG} = \frac{CB}{HG}$	**9.** All sides of similar triangles are proportional.
10. $\angle BKD \cong \angle GKJ$	**10.** Vertical Angles Congruence Theorem

Because $\frac{DK}{JK} = \frac{KC}{KH}$ and $\frac{KB}{KG} = \frac{KC}{KH}$, then $\frac{DK}{JK} = \frac{KB}{KG}$ by the Substitution Property of Equality. You have 2 sides proportional and their included angles congruent. $\triangle BKJ \sim \triangle GKD$ by the Side-Angle-Side Similarity Postulate.

Lesson 6.6

Practice Level A

1. 10 **2.** 15 **3.** true; $\triangle$ Proportionality Thm.

4. false **5.** false **6.** true; $\triangle$ Proportionality Thm. **7.** yes; The triangles are similar by SAS Similarity Thm., so $\angle XZY \cong \angle XWV$, and because corresponding $\measuredangle$ are $\cong$, the lines are $\parallel$.

8. yes; Converse of $\triangle$ Proportionality Thm.

9. yes; $\angle XZY \cong \angle XWV$, so corresponding $\measuredangle$ are $\cong$, and the lines are $\parallel$. **10.** no **11.** A **12.** B

Lesson 6.6, continued

13. D **14.** C **15.** 6 **16.** 6 **17.** 10 **18.** 4.5

19. 7.5 **20.** 6 **21.** $7\frac{5}{7}$ **22.** $3\frac{1}{3}$ **23.** $9\frac{1}{3}$

24. 50 yd **25.** 7.2 ft

Practice Level B

1. GD **2.** EB **3.** GB **4.** GD **5.** AE **6.** CD

7. yes **8.** no **9.** no **10.** yes **11.** 6 **12.** $8\frac{14}{17}$

13. $4\frac{7}{17}$ **14.** $8\frac{2}{5}$ **15.** 8 **16.** $2\frac{1}{3}$ **17.** $5\sqrt{2}$

18. 21 **19.** 2 **20.** $3\frac{3}{4}$ **21.** $1\frac{1}{4}$

22–24. Check student's work.

25. a. 600 ft **b.** yes; If a transversal is perpendicular to one of two parallel lines, then it is perpendicular to the other.

Practice Level C

1. AG **2.** DE **3.** EG **4.** BG **5.** CG **6.** DC

7. no; $\frac{7}{2} \neq \frac{8}{3}$ **8.** yes; $\frac{6}{9} = \frac{2}{3} = \frac{4}{6}$ **9.** yes; $\frac{3}{4} = \frac{3\frac{3}{4}}{5}$

10. 10 **11.** 20 **12.** 10 **13.** $2\frac{2}{3}$ **14.** 7.5

15. 11.25 **16.** 10 **17.** 11.2 **18.** 12.5 **19.** 4.5

20.

Statements	Reasons
1. $\overline{GB} \parallel \overline{FC} \parallel \overline{ED}$	**1.** Given
2. $\angle ABG \cong \angle ADE$	**2.** Corresponding $\measuredangle$s Post.
3. $\angle AGB \cong AED$	**3.** Corresponding $\measuredangle$s Post.
4. $\triangle ABG \sim \triangle ADE$	**4.** AA Similarity Post.

21.

Statements	Reasons
1. $\overline{WZ}$ bisects $\angle XZY$.	**1.** Given
2. $\frac{XW}{XZ} = \frac{WY}{ZY}$	**2.** Thm. 6.7
3. $XW(ZY) = XZ(WY)$	**3.** Cross Products Prop.
4. $XW = WY$	**4.** Def. of segment bisector
5. $XW(ZY) = XZ(XW)$	**5.** Subst. Prop. of Equality
6. $ZY = XZ$	**6.** Div. Prop. of Equality

22. 22.1 in.

Review for Mastery

1. 15 **2.** not parallel **3.** 34 **4.** 21

Problem Solving Workshop: Worked Out Example

1. 35 yd **2.** 5 **3.** $x = 2.25, y = 3$

4. *Sample answer:* Dividing segments proportionally means that the longer part of one segment divided by the smaller part of the same segment is proportional to the longer part of another segment divided by the smaller part of that segment. Dividing segments equally means that the two parts of each segment have the same measure.

Challenge Practice

1. $\angle EGC \cong \angle FED$ by Corresponding $\measuredangle$s thm.
$\angle FED \cong \angle DEC$ is given.
By Transitive prop. $\angle EGC \cong \angle DEC$.
$\angle DEC \cong \angle ECG$ by Alt. int. $\measuredangle$s thm.
By Transitive prop. $\angle EGC \cong \angle ECG$.
So, $\triangle GEC$ is isosceles because $\overline{EG} \cong \overline{EC}$.

2. $\frac{AB}{BC} = \frac{EA}{EC}$ by Thm. 6.7 and $\frac{AG}{GE} = \frac{AC}{CD}$ by Thm. 6.4. Use Prop. of Proportions to get $\frac{AG + GE}{GE} = \frac{AC + CD}{CD}$.
By substitution you get $\frac{AE}{GE} = \frac{AD}{CD}$.
Substitute again to get $\frac{AE}{CE} = \frac{AD}{CD}$.
$\frac{AB}{BC} = \frac{AE}{CE}$ so $\frac{AD}{CD} = \frac{AB}{CB}$.

3. 3 **4.** 4 **5.** $\sqrt{73}$ **6. a.** 4 **b.** 3 **c.** $45\frac{1}{3}$

7. 10 in.

Lesson 6.7

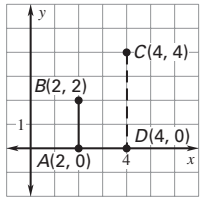
Practice Level A

1. enlargement **2.** reduction **3.** enlargement

4. reduction **5.** $C(2, 2)$, $D(6, 2)$

6. $C(3, 3)$, $D(6, 9)$ **7.** $C(0, 0)$, $D(-15, 10)$

8.



9.