#1. Find the fourth proportional to 4, 6, and 8.

$$\frac{4}{6} = \frac{8}{x} \qquad 4x = 48$$
$$x = \frac{48}{x_1} = \frac{12}{1} = \boxed{12}$$

#2. If $\dfrac{5}{2x} = \dfrac{50}{30y}$, find the ratio of x to y.

$$(5)30y = 50(2x)$$
$$150y = 100x \qquad \frac{x}{y} = \frac{150}{100} = \boxed{\frac{3}{2}}$$

#3. Find the geometric means between 2 and 8.

$$\frac{2}{x} = \frac{x}{8} \qquad x^2 = 16$$
$$x = \boxed{\pm 4}$$

#4. If $1 : 4 = x : 12$, find x.

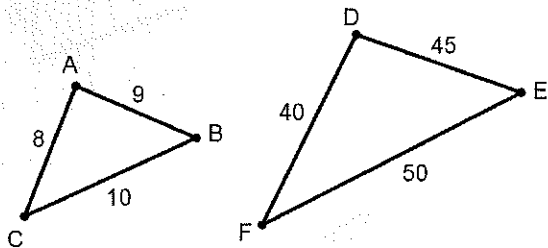$$\frac{1}{4} = \frac{x}{12} \qquad 4x = 12$$
$$x = \boxed{3}$$

#5. If Bob and Jim together can lift 300 pounds, with the ratio of what they can lift being 2:1 (Bob can lift twice what Jim can lift), how much weight can Bob lift?

$$2x + x = 300 \qquad Bob = 2x = \boxed{200\,lbs}$$
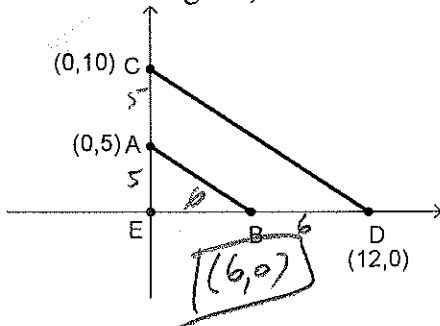$$3x = 300$$
$$x = 100$$

#6. Give the scale factor for the dilation of ABC to DEF:
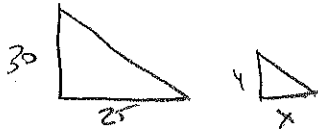

$$\frac{40}{8} = \boxed{5}$$

#7. In the diagram, if $\triangle ECD$ is a dilation of $\triangle EAB$, find the coordinates for point B.

$$\boxed{(6,0)}$$

#8. If a 30 ft tall telephone pole casts a 25 ft shadow, how long will the shadow be for a 4 ft tall boy standing near the telephone pole?
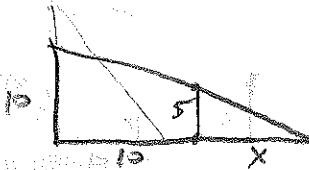
$$\frac{30}{25}=\frac{4}{x}$$

$30x = 4 \cdot 25$
$30x = 100$
$x = \frac{100}{30} = \boxed{\frac{10}{3}} \text{ ft } \left(3\frac{1}{3} \text{ ft}\right)$

#9. Karen is standing 10 feet from a 20 foot tall streetlight. If Karen is 5 feet tall, how long is her shadow? (draw a picture)
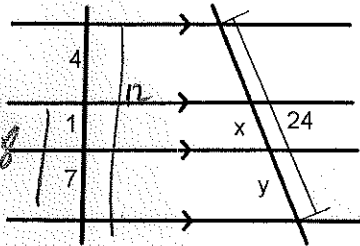
$$\frac{5}{x}=\frac{10}{x+10}$$

$10x = 5(x+10)$
$10x = 5x+50$
$5x = 50$
$x = \boxed{10 \text{ ft}}$

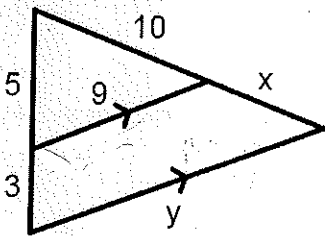#10. Given the diagram, find x+y

$$\frac{8}{12}=\frac{x+y}{24}$$

$12(x+y) = 8 \cdot 24$
$x+y = \frac{8 \cdot 24}{12} = \boxed{16}$

#11. Given the diagram, find x and y
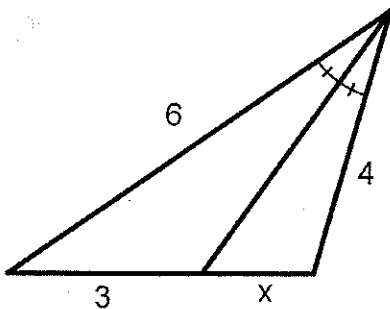
$$\frac{10}{x}=\frac{5}{3}$$

$5x = 30$
$\boxed{x=6}$

$$\frac{9}{5}=\frac{y}{8}$$

$5y = 72$
$y = \boxed{\frac{72}{5}}$

#12. Find x
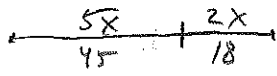
$$\frac{x}{3}=\frac{4}{6}$$

$6x = 12$
$\boxed{x=2}$

#13. If $AB \cdot CD = EF \cdot GH$, then $\dfrac{AB}{GH} = \boxed{\dfrac{EF}{CD}}$

Geometry

Ch 8 Review

day 1
group work

Name ___Key___

Per/Sec. _____ Date _____

1. A stick is broken into two pieces. The shorter piece is 18 cm long. If the lengths of the two pieces are in the ratio 5 to 2, what is the length of the longer piece?

$$\frac{5x}{45} + \frac{2x}{18}$$
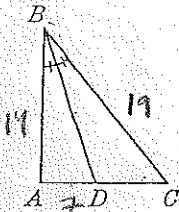
$$2x = 18$$
$$x = 9$$

$$\boxed{45 cm}$$

$$\frac{18}{5} \frac{5}{10}$$

or $\frac{5}{2} = \frac{L}{18}$ $2L = 5(18)$

$$2L = 90$$
$$L = 45$$

2. Find the value of x.

$$\frac{5}{x} = \frac{4}{10}$$

$$4x = 50$$

$$x = \frac{50}{4} = \boxed{\frac{25}{2}}$$

3. In the diagram, $\overline{BD}$ is the angle bisector of $\angle ABC$. $AB = 14$, $BC = 19$ and $AD = 7$. What is the length of $\overline{DC}$?

$$\frac{7}{DC} = \frac{14}{19}$$

$$14 DC = 7 \cdot 19$$

$$14 DC = 133$$

$$DC = \frac{133}{14} = \boxed{\frac{19}{2}}$$

4. Find the coordinates of D if $\overline{AB} \parallel \overline{CD}$.

$$\boxed{(0,8)}$$

5. What is the geometric mean between 5 and 10?

$$\frac{5}{x} = \frac{x}{10}$$

$$x^2 = 50$$

$$x = \boxed{\sqrt{50}}$$

$$= \pm\sqrt{25}\sqrt{2}$$

$$\boxed{\pm 5\sqrt{2}}$$

6. Find the value of x.

$$\frac{x}{4} = \frac{9}{12}$$

$$12x = 36$$

$$\boxed{x = 3}$$

7. In the diagram, the lines ℓ, m, and p are parallel while $a = 16$, $b = 24$, and $c = 18$. What is the value of $c + d$?

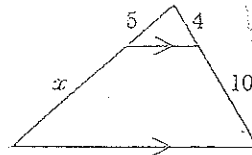$$\frac{16}{24} = \frac{18}{d}$$

$$16d = 18(24)$$

$$d = \frac{18 \cdot 24^3}{16_2} = 27$$

so $c + d = 18 + 27$

$$\boxed{= 45}$$
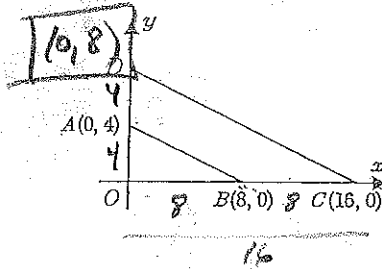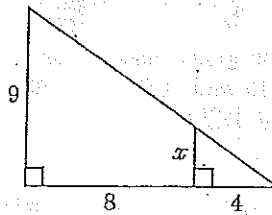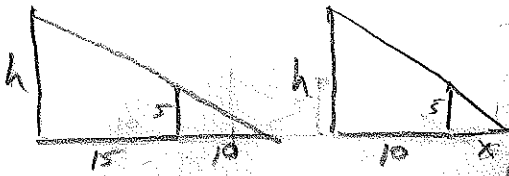
8. If $\triangle PQR \sim \triangle LMN$, then $QR \cdot LN = MN \cdot$ _____.
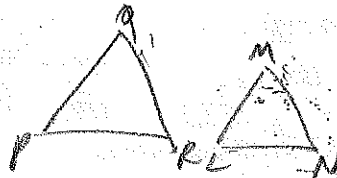
$$\frac{QR}{MN} = \frac{\boxed{PR}}{LN}$$

9. A person 5 feet tall standing 15 feet away from a lamppost casts a 10 foot shadow. When the same person moves 5 feet closer to the lamppost, she will cast a shadow how long?

$\frac{5}{10} = \frac{h}{25}$

$h = \frac{125}{10}$

$\frac{5}{x} = \frac{h}{10+x}$

$xh = 5(10+x)$

$hx = 50 + 5x$

$(h-5)x = 50$

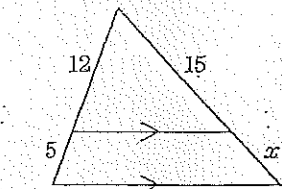$\left(\frac{125}{10} - 5\right)x = 50$

$\left(\frac{125}{10} - \frac{50}{10}\right)x = 50$

$\left(\frac{75}{10}\right)x = 50 \left(\frac{10}{75}\right)$

$x = \frac{20}{3} = 6\frac{2}{3}$

10. In the diagram, the three vertical lines are parallel, $f = 24$, $g = 15$, and $b = 10$. What is the value of $a + b$?
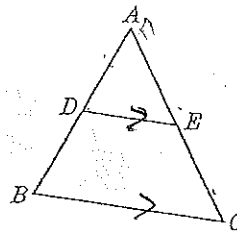
$\frac{10}{15} = \frac{a}{24}$
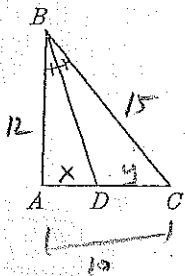
$15a = 240$

$a = \frac{240}{15}$

$a = 16$

$15\overline{)240}$ quotient 16

$a + b = 16 + 10 = \boxed{26}$

11. Find the value of x.

$\frac{12}{5} = \frac{15}{x}$

$12x = 5(15)$

$12x = 75$

$x = \boxed{\frac{75}{12}}$

12. If $\overline{DE} \parallel \overline{BC}$, then it must be that $\frac{AD}{AB} = \frac{AE}{AC}$.

true

13. In the diagram, $\overline{BD}$ is the angle bisector of $\angle ABC$. $AB = 12$, $BC = 15$ and $AC = 10$. What are the lengths of $\overline{AD}$ and $\overline{DC}$?

$\frac{x}{y} = \frac{12}{15}$

$x + y = 10$

$x = 10 - y$

$\frac{10-y}{y} = \frac{12}{15}$

$15(10-y) = 12y$

$150 - 15y = 12y$

$150 = 27y$

$y = \frac{150}{27} = \boxed{\frac{50}{9}}$
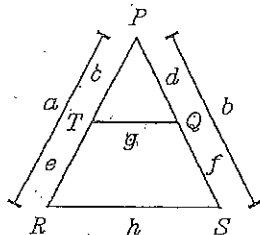
14. A person 6 feet tall standing 18 feet away from a lamppost casts a 9 foot shadow. When the same person moves 4 feet farther from the lamppost, he will cast a shadow how long?

$18 = h$

$\frac{9}{6} = \frac{27}{h}$

$9h = 27 \cdot 6$

$h = \frac{27 \cdot 6}{9} = 18$

$\frac{x}{6} = \frac{x + 22}{18}$

$6x + 6(22) = 18x$

$12x = 6 \cdot 22$

$\frac{12x}{12} = \frac{6 \cdot 22}{12}$

$x = \frac{(6)(22)}{(12)2} = \boxed{11}$

15. If $\overline{RS} \parallel \overline{TQ}$, name the correct proportion.

a) $\frac{g}{h} = \frac{c}{e}$ (b) $\frac{g}{h} = \frac{a}{c}$

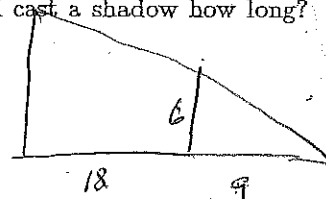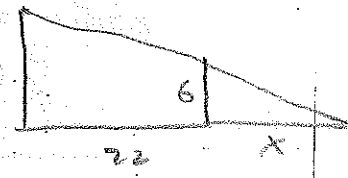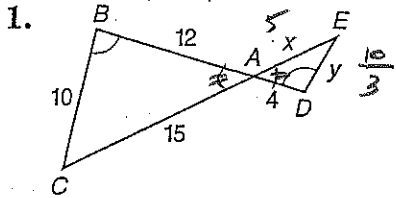c) $\frac{g}{h} = \frac{d}{b}$ d) $\frac{g}{h} = \frac{e}{a}$

$\frac{g}{c} = \frac{h}{a}$

$ga = ch$

$\frac{g}{h} = \frac{c}{a}$
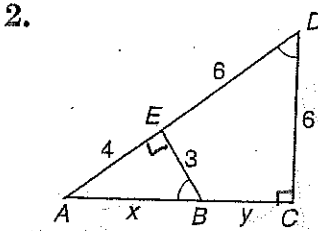
NAME_____ DATE _____

Practice

Identifying Similar Triangles

Identify the similar triangles in each figure. Explain why they are similar and use the given information to find x and y.
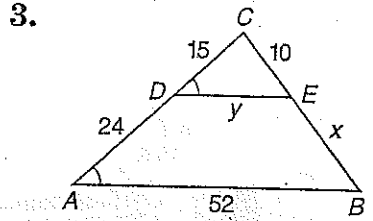
1.

$\sim$ by AA

$\frac{12}{4} = 3 = \frac{15}{x}$

$x = 5$
$y = \frac{10}{3}$

2.

$\sim$ by AA

$x = 5$

$\frac{6}{3} = 2$

$\frac{10}{x} = 2$
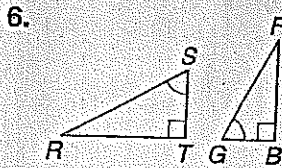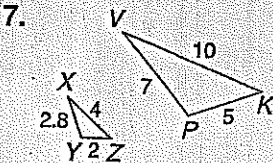
$\frac{8+y}{4} = 2$ $5+y = 8$

$y = 3$

$y = 3$

3.

$\frac{24}{15} = \frac{8}{5} = \frac{x}{10}$

$x = 16$

$y = 20$

$\frac{y}{15} = \frac{5}{39}$ $39y = 15 \cdot 52$

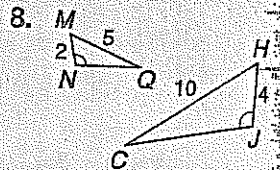$y = \frac{5 \cdot 52 \cdot 4}{39 \cdot 18} = 20$

Practice

Determine whether each pair of triangles is similar. If so, tell which similarity test is used and complete the statement.

6.

$\triangle RST \sim \triangle$ __FGB__?
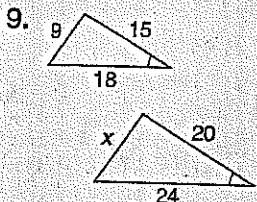
by AA

7.

$\triangle XYZ \sim \triangle$ __?__ VPK by

$\frac{10}{4} = \frac{5}{2}$ $\frac{5}{2} = \frac{7}{28}$ $14 = 14$ ✓
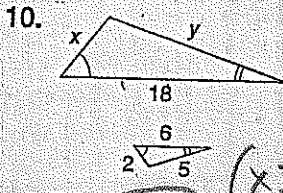
8.

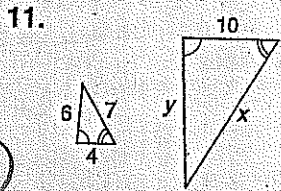$\triangle MNQ \sim \triangle$ __?__ no

Find the value of each variable.

9.

$\frac{4}{3} = \frac{20}{18} = \frac{x}{9}$

$3x = 36$

$x = 12$

10.

$x = 6$

$y = 15$

11.

$\frac{10}{y} = \frac{5}{2}$

$y = 15$

$\frac{35}{2} = x$

8 SIMILAR POLYGONS

Use similar triangles to solve.

1

$\frac{18}{12} = \frac{h}{42}$

$12h = 18(42)$

$h = \frac{\overset{3}{18}(42)21}{12_{\times}}$

$h = 63$

18 ft

12 ft   42 ft

How tall is the tree?

2

x m

tee   40 m

250 m   50 m

What is the length of the fairway?

1 __63 ft__

2 __200 m__

$\frac{40}{50} = \frac{x}{250}$

$50x = 40(250)$

$x = \frac{40 \cdot 250}{50} = 200$

3

x km

3 km   10 km

4 km

$\frac{4}{3} = \frac{10}{x}$

$4x = 30$

$x = \frac{30}{4} = \frac{15}{2}$ km

How far apart are the lighthouses?

4

x m

45 m

15 m

30 m

$\frac{15}{30} = \frac{45}{x}$

$15x = 30(45)$
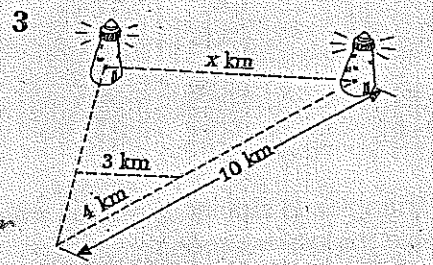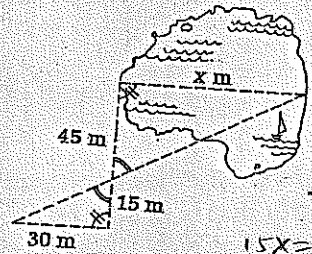
$x = 2 \cdot 45 = 90$

How wide is the lake?

3 __15/2 km (= 7.5 km)__

4 __90 m__

5

x in.   6 in.

25 in.   20 in.

$\frac{6}{20} = \frac{x}{25}$

$20x = 6.25$

$x = \frac{6.25}{20} = ?$

How high above the table should the ball be hit to just clear the net?

6

X

5½ ft

8 ft   10 ft

If you were playing catch against a wall as shown, how high on the wall would the ball hit?

5 __$\frac{15}{2}$ = 7.5 in.__

6 __4.4 ft__

$\frac{x}{8} = \frac{11/2}{10}$ $10x = 8 \cdot \frac{11}{2} = 44$

$x = \frac{44}{10}$

7

tee

9 ft

cup   10 ft

4 ft   5

7 __$\frac{81}{4}$ ft__

$\frac{4}{9} = \frac{5}{x}$

$4x = 45$ $x = \frac{45}{4}$

$9 + \frac{45}{4}$

$\frac{36}{4} + \frac{45}{4} = \frac{81}{4}$
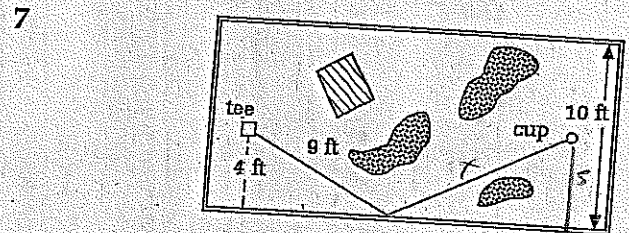
At the Mini-Putt Golf Course, the cup is centered between the edges of the fairway. Wendy's ball traveled 9 feet from the tee, banked off the edge, and ended up in the cup, which was midway between the two longer edges. How far did the ball travel?

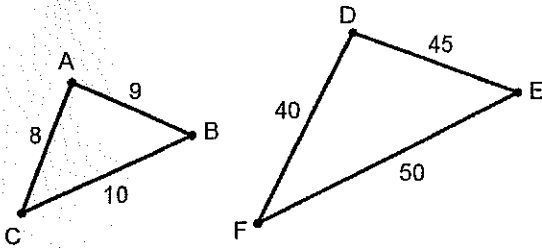#1. Find the fourth proportional to 4, 6, and 8.

#2. If $\dfrac{5}{2x} = \dfrac{50}{30y}$, find the ratio of x to y.

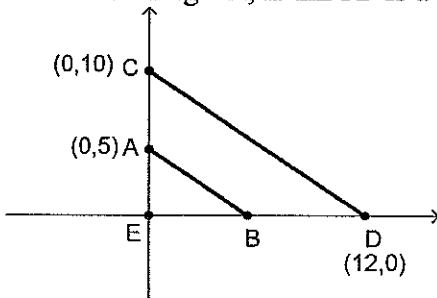#3. Find the geometric means between 2 and 8.

#4. If $1 : 4 = x : 12$, find x.

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#9. Karen is standing 10 feet from a 10 foot tall streetlight. If Karen is 5 feet tall, how long is her shadow? (draw a picture)
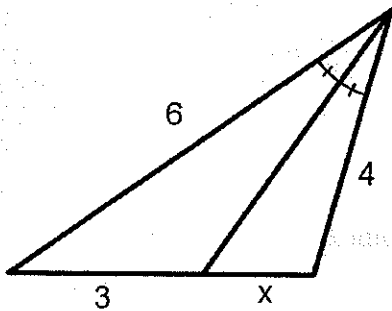
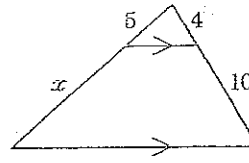#10. Given the diagram, find x+y
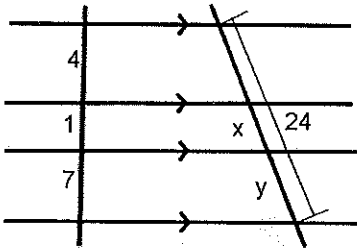
#11. Given the diagram, find x and y
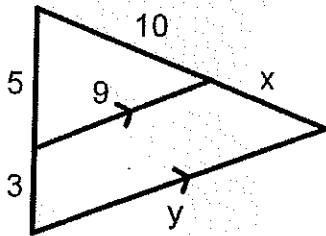
#12. Find x

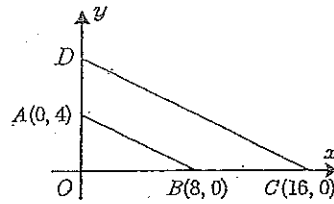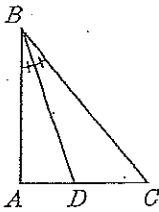#13. If $AB \cdot CD = EF \cdot GH$, then $\dfrac{AB}{GH} = $ —

1. A stick is broken into two pieces. The shorter piece is 18 cm long. If the lengths of the two pieces are in the ratio 5 to 2, what is the length of the longer piece?

2. Find the value of x.

3. In the diagram, $\overline{BD}$ is the angle bisector of $\angle ABC$. $AB = 14$, $BC = 19$ and $AD = 7$. What is the length of $\overline{DC}$?
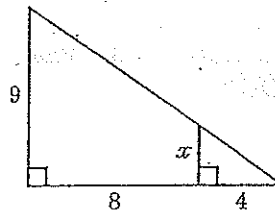

4. Find the coordinates of D if $\overline{AB} \parallel \overline{CD}$.
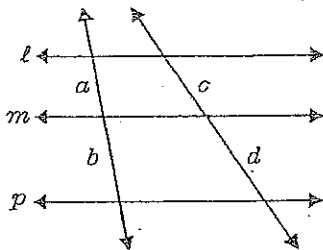

5. What is the geometric mean between 5 and 10?
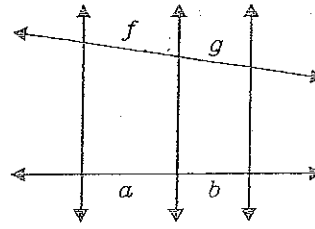
6. Find the value of x.

7. In the diagram, the lines ℓ, m, and p are parallel while $a = 16$, $b = 24$, and $c = 18$. What is the value of $c + d$?

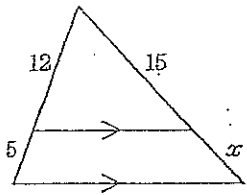8. If $\triangle PQR \sim \triangle LMN$, then $QR \cdot LN = MN \cdot$ _____ .

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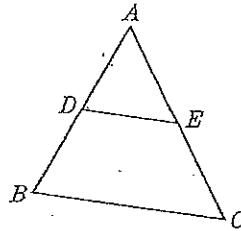
10. In the diagram, the three vertical lines are parallel, $f = 24$, $g = 15$, and $b = 10$. What is the value of $a + b$?
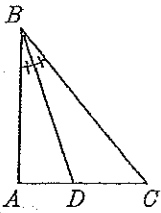

11. Find the value of x.

12. If $\overline{DE} \parallel \overline{BC}$, then it *must* be that $\dfrac{AD}{AB} = \dfrac{AE}{AC}$.

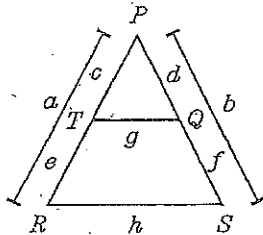

13. In the diagram, $\overline{BD}$ is the angle bisector of $\angle ABC$. $AB = 12$, $BC = 15$ and $AC = 10$. What are the lengths of $\overline{AD}$ and $\overline{DC}$?

14. A person 6 feet tall standing 18 feet away from a lamppost casts a 9 foot shadow. When the same person moves 4 feet farther from the lamppost, he will cast a shadow how long?

15. If $\overline{RS} \parallel \overline{TQ}$, name the correct proportion.

a) $\dfrac{g}{h} = \dfrac{c}{e}$ b) $\dfrac{g}{h} = \dfrac{a}{c}$

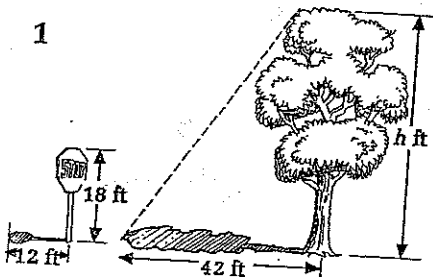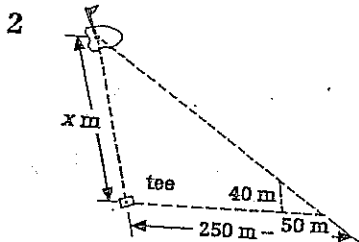c) $\dfrac{g}{h} = \dfrac{d}{b}$ d) $\dfrac{g}{h} = \dfrac{e}{a}$

8 | SIMILAR POLYGONS

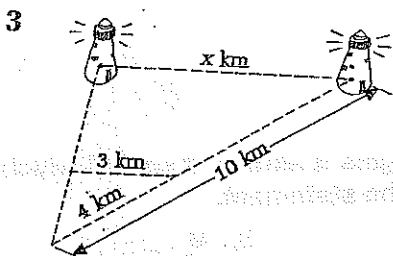Use similar triangles to solve.

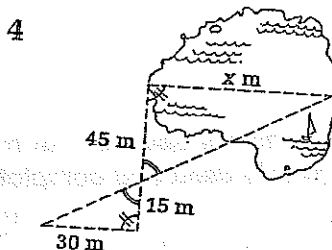**1**

How tall is the tree?

2

What is the length of the fairway?
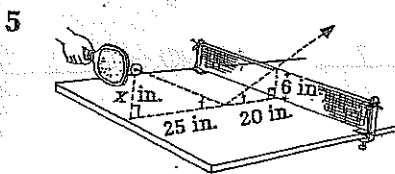
1 _____

2 _____

3

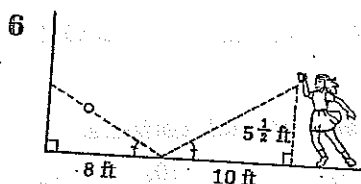How far apart are the lighthouses?

4

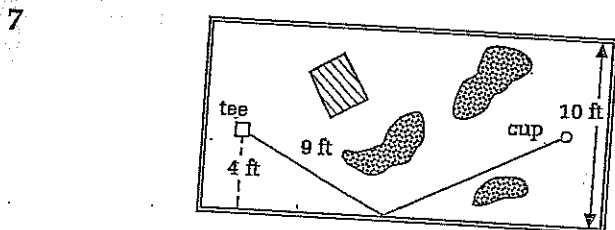How wide is the lake?

3 _____

4 _____

5

How high above the table should the ball be hit to just clear the net?

6

If you were playing catch against a wall as shown, how high on the wall would the ball hit?

5 _____

6 _____

7

7 _____

At the Mini-Putt Golf Course, the cup is centered between the edges of the fairway. Wendy's ball traveled 9 feet from the tee, banked off the edge, and ended up in the cup, which was midway between the two longer edges. How far did the ball travel?
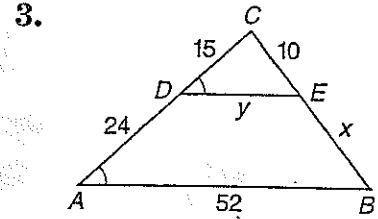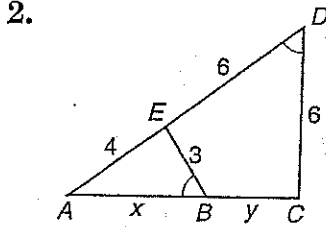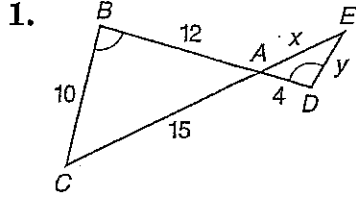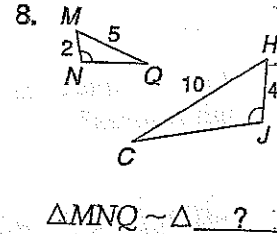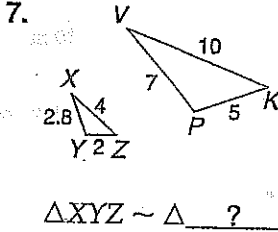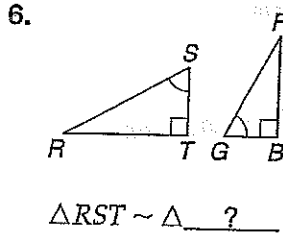
Practice

Identifying Similar Triangles

Identify the similar triangles in each figure. Explain why they are similar and use the given information to find x and y.

1.

2.

3.

Practice

Determine whether each pair of triangles is similar. If so, tell which similarity test is used and complete the statement.

6.

7.

8.

$\triangle RST \sim \triangle$___?___

$\triangle XYZ \sim \triangle$___?___

$\triangle MNQ \sim \triangle$___?___

Find the value of each variable.

9.

10.

11.