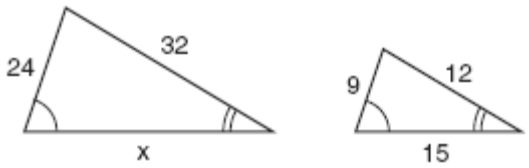
CHAPTER 10-1

SIMILARITY

1. 010410a, P.I. G.G.45
The accompanying diagram shows two similar triangles.

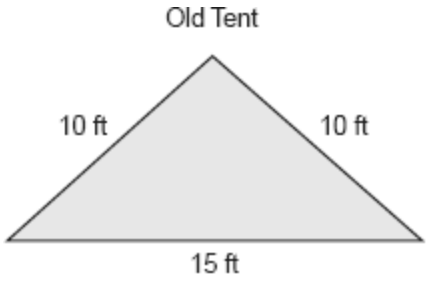


Which proportion could be used to solve for x?

[A] $\frac{32}{x}=\frac{12}{15}$ [B] $\frac{x}{24}=\frac{9}{15}$

[C] $\frac{24}{9}=\frac{15}{x}$ [D] $\frac{32}{12}=\frac{15}{x}$

2. 060024a, P.I. G.G.45
The Rivera family bought a new tent for camping. Their old tent had equal sides of 10 feet and a floor width of 15 feet, as shown in the accompanying diagram.



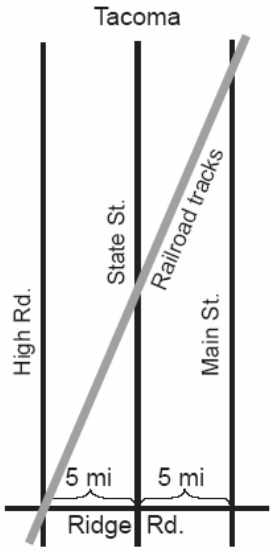
If the new tent is similar in shape to the old tent and has equal sides of 16 feet, how wide is the floor of the new tent?

3. 060307a, P.I. G.G.45
A triangle has sides whose lengths are 5, 12, and 13. A similar triangle could have sides with lengths of

[A] 6, 8, and 10 [B] 3, 4, and 15

[C] 7, 24, and 25 [D] 10, 24, and 26

4. 080021a, P.I. G.G.45
The accompanying diagram shows a section of the city of Tacoma. High Road, State Street, and Main Street are parallel and 5 miles apart. Ridge Road is perpendicular to the three parallel streets. The distance between the intersection of Ridge Road and State Street and where the railroad tracks cross State Street is 12 miles. What is the distance between the intersection of Ridge Road and Main Street and where the railroad tracks cross Main Street?

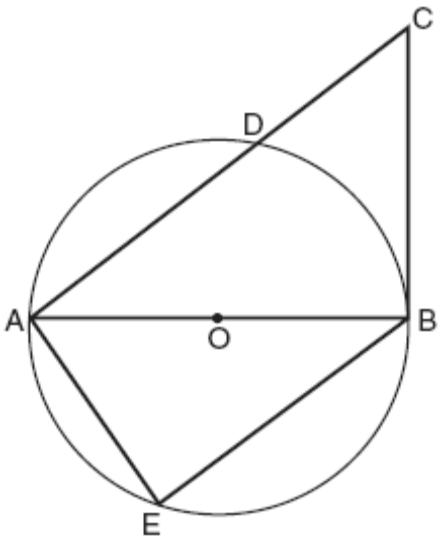


5. 010532a, P.I. G.G.58
Fran's favorite photograph has a length of 6 inches and a width of 4 inches. She wants to have it made into a poster with dimensions that are similar to those of the photograph. She determined that the poster should have a length of 24 inches. How many inches wide will the poster be?

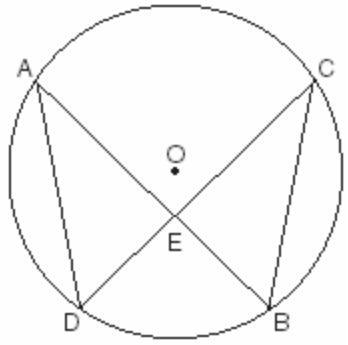
CHAPTER 10-2

PROOFS

6. 080627b, P.I. G.G.44
In the accompanying diagram of circle *O*, diameter $\overline{AOB}$ is drawn, tangent $\overline{CB}$ is drawn to the circle at *B*, *E* is a point on the circle, and $\overline{BE} \parallel \overline{ADC}$. Prove: $\Delta ABE \sim \Delta CAB$

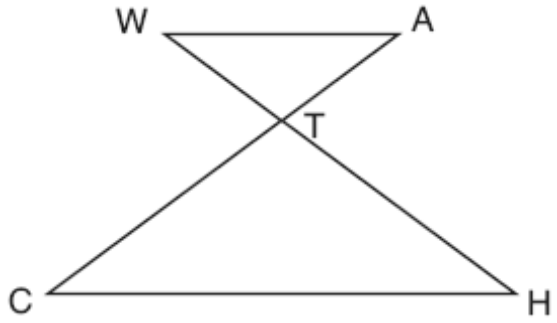


7. 060133b, P.I. G.G.44
Given: chords $\overline{AB}$ and $\overline{CD}$ of circle *O* intersect at *E*, an interior point of circle O; chords $\overline{AD}$ and $\overline{CB}$ are drawn.



Prove: *(AE)(EB) = (CE)(ED)*

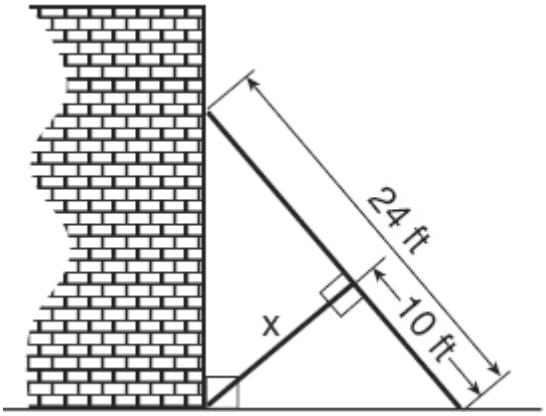
8. 010833b, P.I. G.G.44
In the accompanying diagram, $\overline{WA} \parallel \overline{CH}$ and $\overline{WH}$ and $\overline{AC}$ intersect at point *T*. Prove that (*WT*)(*CT*) = (*HT*)(*AT*).



CHAPTER 10-3

SIMILARITY

9. 010619b, P.I. G.G.47
The accompanying diagram shows a 24-foot ladder leaning against a building. A steel brace extends from the ladder to the point where the building meets the ground. The brace forms a right angle with the ladder.



If the steel brace is connected to the ladder at a point that is 10 feet from the foot of the ladder, which equation can be used to find the length, *x*, of the steel brace?

[A] $10^2 + x^2 = 24^2$ [B] $10^2 + x^2 = 14^2$

[C] $\frac{10}{x} = \frac{x}{24}$ [D] $\frac{10}{x} = \frac{x}{14}$

CHAPTER 10-5

10. 010505a, P.I. G.G.45
The perimeter of $\Delta A'B'C'$, the image of ΔABC, is twice as large as the perimeter of ΔABC. What type of transformation has taken place?

[A] dilation [B] translation

[C] rotation [D] reflection

11. 060411a, P.I. G.G.45
Delroy's sailboat has two sails that are similar triangles. The larger sail has sides of 10 feet, 24 feet, and 26 feet. If the shortest side of the smaller sail measures 6 feet, what is the perimeter of the *smaller* sail?

[A] 60 ft [B] 100 ft

[C] 15 ft [D] 36 ft

12. 060208a, P.I. G.G.45
Two triangles are similar. The lengths of the sides of the smaller triangle are 3, 5, and 6, and the length of the longest side of the larger triangle is 18. What is the perimeter of the larger triangle?

[A] 14 [B] 18 [C] 42 [D] 24

13. 010704a, P.I. G.G.45
The base of an isosceles triangle is 5 and its perimeter is 11. The base of a similar isosceles triangle is 10. What is the perimeter of the larger triangle?

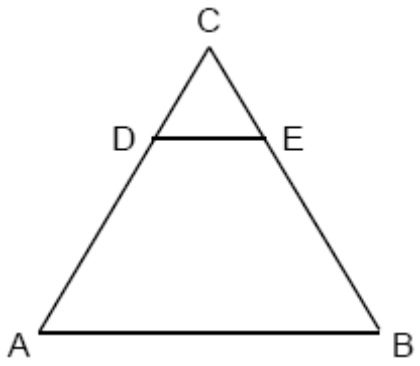
[A] 22 [B] 110 [C] 15 [D] 21

14. 060524a, P.I. G.G.45
On a scale drawing of a new school playground, a triangular area has sides with lengths of 8 centimeters, 15 centimeters, and 17 centimeters. If the triangular area located on the playground has a perimeter of 120 meters, what is the length of its longest side?

[A] 40 m [B] 45 m

[C] 51 m [D] 24 m

15. 089915a, P.I. G.G.45
In the accompanying diagram of equilateral triangle *ABC*, $DE = 5$ and $\overline{DE} \parallel \overline{AB}$.



If *AB* is three times as long as *DE*, what is the perimeter of quadrilateral *ABED*?

[A] 20 [B] 40 [C] 30 [D] 35

16. 060322a, P.I. G.G.58
The lengths of the sides of two similar rectangular billboards are in the ratio 5:4. If 250 square feet of material is needed to cover the larger billboard, how much material, in square feet, is needed to cover the smaller billboard?

17. 089918a, P.I. G.G.58
The ratio of the corresponding sides of two similar squares is 1 to 3. What is the ratio of the area of the smaller square to the area of the larger square ?

[A] 1:3 [B] $1:\sqrt{3}$ [C] 1:6 [D] 1:9

18. 080101a, P.I. G.G.45
The perimeter of an equilateral triangle varies directly as the length of a side. When the length of a side is doubled, the perimeter of the triangle is

[A] doubled [B] multiplied by 3

[C] halved [D] divided by 3

19. 080729a, P.I. G.G.45
Which is *not* a property of all similar triangles?

[A] The corresponding sides are congruent.

[B] The altitudes are in the same ratio as the corresponding sides.

[C] The corresponding angles are congruent.

[D] The perimeters are in the same ratio as the corresponding sides.

20. 060215a, P.I. G.G.58
If the circumference of a circle is doubled, the diameter of the circle

[A] increases by 2 [B] is doubled

[C] remains the same

[D] is multiplied by 4

[1] A

[2] 24 feet and appropriate work is shown, such as $\frac{10}{15}=\frac{16}{x}$ or = $\frac{10}{16}=\frac{15}{x}$.
[1] An appropriate proportion is shown, but an incorrect solution or no solution is found.
or [1] An incorrect proportion of equal difficulty is shown, but an appropriate solution for the proportion written is found.
or [1] 24 feet but no work is shown.
[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.
[2]

[3] D

[2] 24 miles and appropriate work is shown, such as using a proportion, showing doubling of the sides, or using any other appropriate method.
[1] Appropriate work is shown, but one computational or substitution error is made.
or [1] An incorrect proportion is appropriately solved.
or [1] 24 but no work is shown.
[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.
[4]

[2] 16, and appropriate work is shown, such as $\frac{6}{4}=\frac{24}{x}$ or a labeled diagram.
[1] Appropriate work is shown, but one computational error is made.
or [1] Appropriate work is shown, but one conceptual error is made.
or [1] An incorrect proportion is written, but it is solved appropriately.
or [1] 16, but no work is shown.
[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.
[5]

[4] A complete and correct proof that includes a concluding statement is written.
[3] A proof is written that demonstrates a thorough understanding of the method of proof and contains no conceptual errors, but one reason is missing or is incorrect or the concluding statement is missing.
or [3] Two pairs of angles are proven congruent, but the triangles are not proven similar.
[2] A proof is written that demonstrates a good understanding of the method of proof and contains no conceptual errors, but two statements or reasons are missing or are incorrect.
or [2] A proof is written that demonstrates a good understanding of the method of proof, but one conceptual error is made, such as using an incorrect method to prove that two angles are congruent.
or [2] $\angle E$ and $\angle ABC$ are proven congruent, but the remainder of the proof is missing or is incorrect.
[1] Some correct relevant statements about the proof are made, such as showing that $\angle CAB$ and $\angle ABE$ are congruent, but the remainder of the proof is missing or is incorrect.
[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.
[6]

[6] A complete and correct proof is shown, such as the example below:

Statements	Reasons
1 Chords $\overline{AB}$ and $\overline{CD}$ of circle O intersect at E, and chords $\overline{AB}$ and $\overline{CD}$ are drawn.	1 Given
2 $\angle A \cong \angle C$	2 Inscribed angles of a circle that intercept the same arc are congruent.
3 $\angle AED \cong \angle CEB$	3 Vertical angles are congruent.
4 $\triangle AED \sim \triangle CEB$	4 AA $\cong$ AA
5 $\frac{AE}{CE} = \frac{ED}{EB}$	5 Corresponding sides of similar triangles are in proportion.
6 $(AE)(EB) = (CE)(ED)$	6 In a proportion, the product of the means equals the product of the extremes.

[5] ΔAED and ΔCEB are correctly proved to be similar, and the appropriate proportion is written with justification.
or [5] A correct proof is shown, but one of the justifications is missing or is incorrect.
[4] ΔAED and ΔCEB are correctly proved to be similar, but no further work is shown.
[3] A correct proof is shown, but more than one justification is missing or is incorrect.
[2] The triangles are said to be similar, and the conclusion is written.
[1] Only one correct statement and justification are given.
[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

[7]

[6] A complete and correct proof that includes a concluding statement is written.
[5] A proof is written that demonstrates a thorough understanding of the method of proof and contains no conceptual errors, but one statement or reason is missing or is incorrect or no concluding statement is written.
or [5] $\frac{WT}{HT} = \frac{AT}{CT}$ or an equivalent proportion is proven, but no further correct work is shown.
[4] A proof is written that demonstrates a good understanding of the method of proof and contains no conceptual errors, but two statements and/or reasons are missing or are incorrect.
[3] A proof is written that demonstrates a good understanding of the method of proof, but one conceptual error is made.
or [3] $\Delta WAT \sim \Delta HCT$ is proven, but no further correct work is shown.
[2] Some correct relevant statements about the proof are made, but three or four statements and/or reasons are missing or are incorrect.
[1] Only one correct statement and reason are written, other than the given and/or the prove statements.
[0] A zero response is completely incorrect, irrelevant or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

[8]

[9] D

[10] A

[11] D

[12] C

[13] A

[14] C

[15] B

[2] 160, and appropriate work is shown, such as the proportion $\frac{25}{16}=\frac{250}{x}$.

[1] Appropriate work is shown, but one computational error or one conceptual error is made, such as $\frac{5}{4}=\frac{250}{x}$.

or [1] 160, but no work is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

[16]

[17] D

[18] A

[19] A

[20] B