

Solve the following proportions :

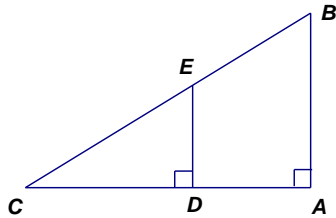
1. $\frac{11}{26} = \frac{x}{15}$

2. $\frac{5}{x-1} = \frac{7}{x}$

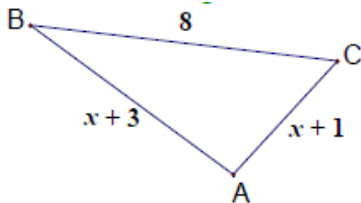
3. $\frac{y}{2y+3} = \frac{y-8}{y-3}$

4. Please find the geometric mean of 8 and 30 in simplest radical form.
5. A board that is 18 inches long is cut into two pieces in the ratio 1 : 5. Find the length of each piece.
6. The measures of the angles of a triangle are in the extended ratio of 4: 5: 6. Find the measures of the angles in the triangle.
7. A rectangular region of land has a perimeter of 320 feet and the ratio of its length to width is 3 : 1. Find the length and the width of the region of land.
8. The area of a rectangle is 4320 square inches. The ratio of the width to the length is 5:6. Find the length and the width.
9. A map has a scale of 0.5 inch : 10 miles. If the actual distance between the two cities is 340 miles, how far apart are they on the map?

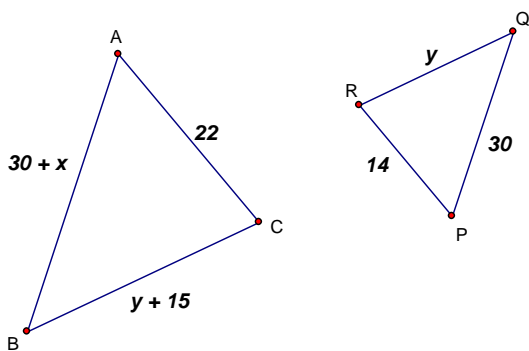
10. If two polygons are similar, then the corresponding angles must be _____.
11. If two polygons are similar, then the corresponding sides must be _____.
12. In the diagram, $\triangle ECD \sim \triangle BCA$. $CE = 39$, $ED = 11$, and $AB = 14.9$. Please solve for BC to the nearest tenth.



13. The side lengths of $\triangle ABC$ are related like this: $AB:BC:AC$ with an extended ratio of $3:4:2$. Please find the length of each side.



14. Solve for x and y , given that $\triangle ABC \sim \triangle PQR$. Round your answers to nearest tenth if necessary.



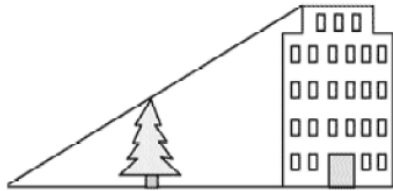
15. The perimeter of $\triangle PQR$ is 80, $PQ = 30$ and $ST = 18$. If $\triangle PQR \sim \triangle STU$, what is the perimeter of $\triangle STU$?

16. A photo needs to be enlarged from an original with a length of 12 inches and a width of 10 inches to a size where the new width is 50 inches. What is the new length? What is the scale factor?

17. A building casts a shadow 200 meters long. At the same time, a pole 4 meters high casts a shadow 20 meters long. What is the height of the building?

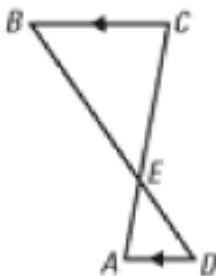
18. Marcia wants to measure the height of the flagpole at her school. She places a mirror on the ground 56 feet from the flagpole, then walks backward until she is able to see the top of the flagpole in the mirror. Her eyes are 5.5 feet above the ground, and she is 11 feet from the mirror. What is the height of the flagpole to the nearest tenth of a foot?

19. Melody wants to find the height of the tallest building in the city. She stands 422 feet away from the building. There is a tree 40 feet in front of her, which she knows is 22 feet tall. How tall is the building to the nearest foot?

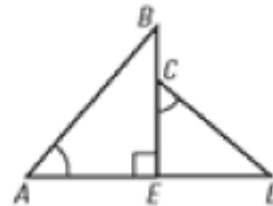


For Questions 20 – 23, determine whether the triangles are similar. If they are, give a reason why and write a similarity statement.

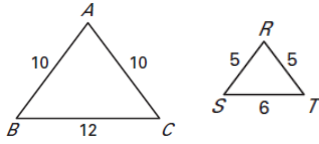
20.



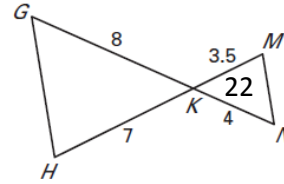
21.



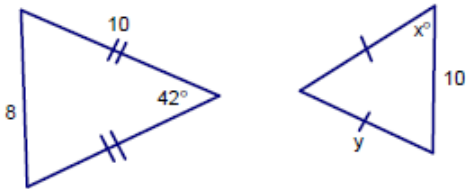
22.



23.

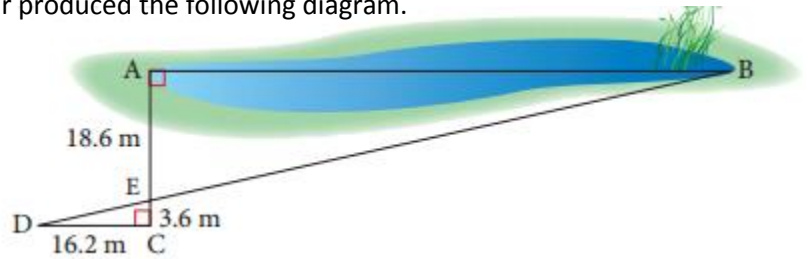


24. The two triangles are similar. Please find the values of x and y . (Diagram not drawn to scale).



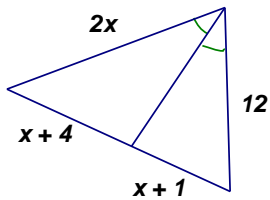
25. To calculate the length of a marsh, a surveyor produced the following diagram.

a) Please write a similarity statement and explain why the triangles are similar.

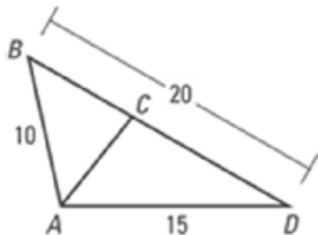


b) Please find the length of the marsh to the nearest tenth of a unit.

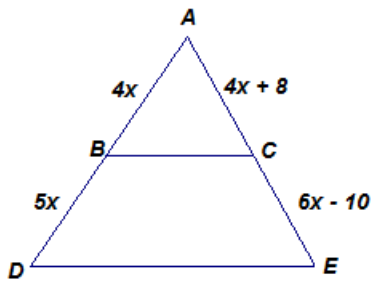
26. Please find the value of x .



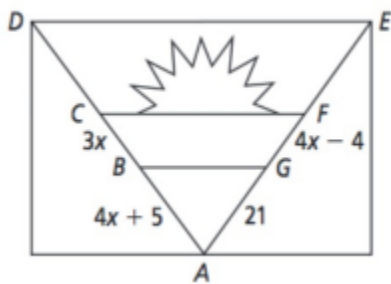
27. Given that $\angle BAC \cong \angle DAC$, please find BC .



28. Please find CE so that $\overline{BC} \parallel \overline{DE}$.

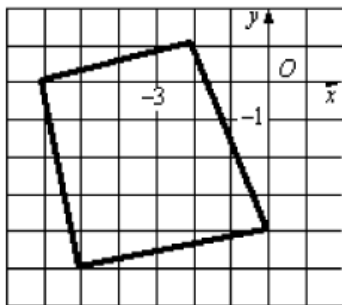


29. An artist made a sketch of the flag of Antigua and Barbuda for a mural. In the image, $\overline{BG} \parallel \overline{CF}$. The measures indicate the length of the lines in feet. What is the value of x ?

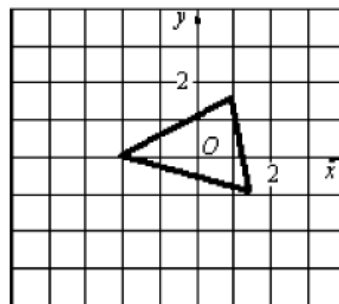


Draw the image of the given figure after a dilation with center $(0, 0)$ and the given scale factor.

30. Scale factor : $\frac{1}{2}$

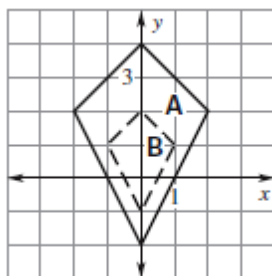


31. Scale factor : -2

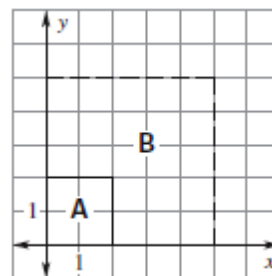


Determine whether the dilation from Figure A to Figure B is a *reduction* or an *enlargement*. Then find its scale factor.

32.



33.



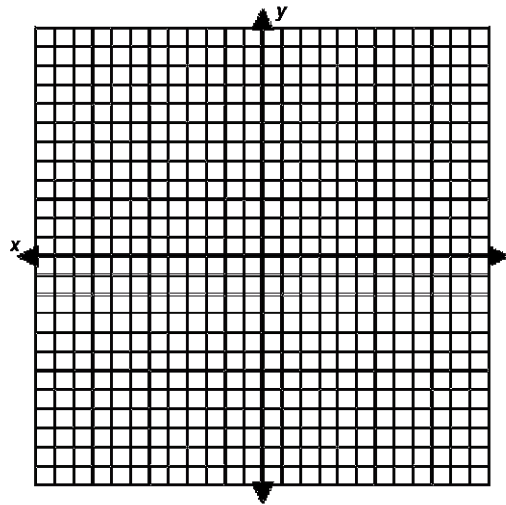
34. The table below shows the coordinates of $\triangle RST$ and the coordinates of R' in $\triangle R'S'T'$ under a dilation centered at the origin.

Triangle RST		Triangle R'S'T'	
R	(-2, -3)	R'	(-6, -9)
S	(0, 2)	S'	
T	(2, -3)	T'	

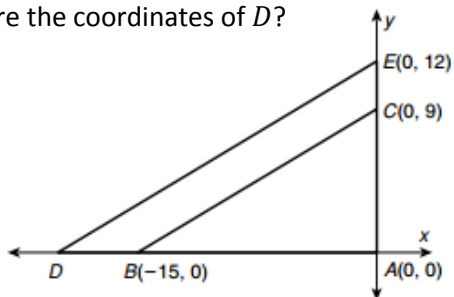
What are the coordinates of S' and T' ? Explain how you determined your answer.

35. $\triangle ABC$ has vertices $A(1, 2)$, $B(2, 3)$ and $C(3, 1)$. $\triangle ABC$ is dilated by a scale factor of 3 and dilated again by a scale factor of $\frac{1}{2}$. The resulting image is $\triangle A'B'C'$. What are the coordinates of the vertices for $\triangle A'B'C'$?

36. $\triangle ABC$ has vertices $A(4, 2)$, $B(4, 6)$ and $C(7, 2)$. Find the vertices that represent a dilation of $\triangle ABC$ centered at $(4, 0)$ with a scale factor of 2.



37. $\triangle EAD$ is the dilation image of $\triangle CAB$ about the origin. Find the scale factor for the dilation. What are the coordinates of D ?



ANSWER KEY :

- 1) 6.3 2) $\frac{7}{2}$ 3) $y = -2$ or $y = 12$ 4) $4\sqrt{15}$ 5) 3in, 15in
- 6) 48, 60, 72 7) 40ft, 120ft 8) 72 in. and 60 in. 9) 17 inches 10) Congruent
- 11) Proportional 12) 52.8 13) 6, 8, 4 14) $x \approx 17.1$, $y = 26.25$
- 15) 48 16) 60 in, Scale factor 5 : 1 17) 40m
- 18) 28 ft 19) 232 ft 20) $\triangle ECB \sim \triangle EAD$, AA ~ 21) $\triangle AEB \sim \triangle CED$, AA ~
- 22) $\triangle BAC \sim \triangle SRT$, SSS~ 23) $\triangle HKG \sim \triangle MKN$, SAS~ 24) $x = 69^\circ$, $y = 12.5$
- 25) a) $\triangle CED \sim \triangle AEB$ by AA~ since the right angles are congruent and Vertical angles are congruent.
b) 83.7 m
- 26) 8 27) 8 28) 110 29) 4
- 30) New Coordinates : (-3, 0) (-1, 0.5) (0, -2) (-2.5, -2.5)
- 31) New Coordinates : (4, 0) (-2, -3) (-3, 2) 32) Reduction, scale factor : $\frac{1}{2}$
- 33) Enlargement, scale factor : 2.5 34) S' (0, 6), T' (6, -9), Scale factor is 3
- 35) A'(3/2, 3), B'(3, 9/2), C'(9/2, 3/2) 36) A'(4, 4), B'(4, 12), C'(10, 4)
- 37) $k = 4/3$; D(-20, 0)