Name:

1. What does it mean for two triangles to be similar?

2. What is meant by the similarity ratio?

3. How can two triangles be proven similar?

Determine whether each pair of figures is similar. If so, write a similarity statement and scale factor. If not explain your reasoning.



State whether or not the polygons are similar. If they are then give the similarity ratio:





For #9 and #10 solve the proportions.

- 9. $\frac{6}{x+3} = \frac{x-3}{9}$ 10. $\frac{3y}{10} = \frac{54}{5y}$
 - 11. An architect's model for a building is 2.7 m long and 1.1 m wide. The actual building is 360 m wide. What is the length of the building?

For #12 and #13 find the value of x, y, and z.

12. DABC~DDEF





14. Given: $\triangle ABC \sim \triangle DFE$



Find: $m \angle D$ and \overline{EF}

- 15. If $\Delta DEF \sim \Delta GHI$, m $\neq G = 110^\circ$, and m $\neq E = 25^\circ$, what is m $\neq F$?
- 16. Given that $\Delta JHK \sim \Delta POM$ and $m \neq H = 90^{\circ}$, $m \neq J = 40^{\circ}$, $\neq m = x + 5$, $\neq O = \frac{1}{2}y$. Find the values of x and y.

17. Find the value of x that makes $\triangle ABC \sim \triangle DEF$.



<u>Given:</u> $\Delta ABC \sim \Delta DEF$ 18. If BC = 24, EF = 9, AC = y + 10, and DF = y, find AC.

19. $\triangle ABC \sim \triangle DEF$, AB = 7x, BC = 4, DE = 7, and EF = x.

What is the length of \overline{AB} ?

20. $\triangle ABC \sim \triangle DEF$, DE = 4, AB = x, AC = x + 2, and DF = x + 6.

Determine the length of \overline{AB} .

21. AB = 10 and CD = 18. Find EB, BC, and AC.



22. A 5 ft 9 in. man cast a 6 ft 6 in. shadow. At the same time of day, a tree casts a 50 ft shadow. What is the height of the tree?



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23. A tree stops a surveyor from directly measuring the length of a lot line. She locates points *E*, *F*, *G*, *H*, and *I* as shown. What are the lengths of *EF* and *GH*?

- 24. Leonardo da Vinci's famous portrait of the *Mona Lisa* is 30 in. tall and 21 in. wide. *Jonathon* has a postage stamp of the *Mona Lisa* that is similar to the original painting. The height of the postage stamp is 4 cm. What is the width?
 - 25. A clever outdoorsman whose eye-level is 2 meters above the ground, wishes to find the height of a tree. He places a mirror horizontally on the ground 20 meters from the tree, and finds that if he stands at a point C which is 4 meters from the mirror B, he can see the reflection of the top of the tree. How high is the tree?





Prove: △MNO~△PQO

27. Given: MQ OP



Prove: △MNQ~△PON