Right Triangles and the Tangent Ratio

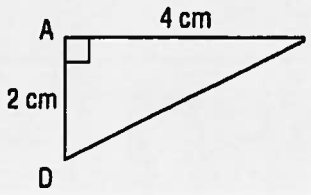
One example of a **trigonometric ratio** is the **tangent** ratio.

In a right triangle, the tangent ratio of an acute angle is defined as

$$\frac{\text{side opposite the angle}}{\text{side adjacent to the angle}}.$$

In $\triangle FGH$, the tangent ratio of $\angle H$ is $\frac{FG}{GH}$.

In $\triangle FGH$, the tangent ratio of $\angle F$ is $\frac{GH}{FG}$.



Use a calculator to find the tangent of each angle, to three decimal places.

1. 37° _____
2. 84° _____
3. 15° _____
4. 45° _____
5. 60° _____
6. 72° _____

Find $\angle K$, to the nearest degree.

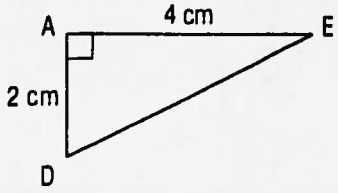
7. $\tan K = 0.575$ ___
8. $\tan K = 0.243$ ___
9. $\tan K = 1.925$ ___
10. $\tan K = 2.750$ ___
11. $\tan K = 3.198$ ___
12. $\tan K = 50.375$ ___

Find $\angle Q$, to the nearest degree.

13. $\tan Q = \frac{1}{3}$ ____
14. $\tan Q = \frac{5}{8}$ ____
15. $\tan Q = \frac{5}{4}$ ____
16. $\tan Q = \frac{12}{5}$ ____
17. $\tan Q = \frac{49}{9}$ ____
18. $\tan Q = \frac{89}{2}$ ____

Calculate tan D and $\angle D$ and tan E and $\angle E$. Round each angle measure, to the nearest degree.

19.



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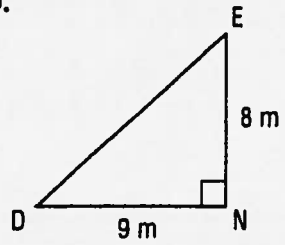

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Calculate x, to the nearest tenth of a metre.

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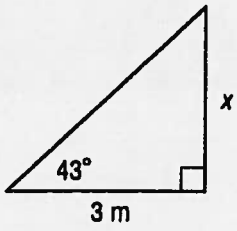

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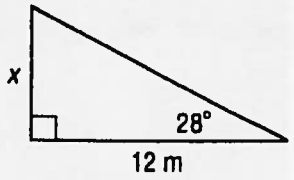

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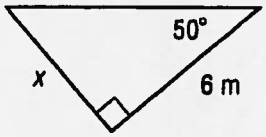

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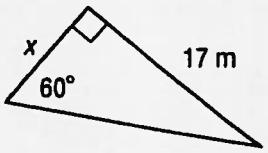

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25. The backyard of a home is in the shape of a right triangle in which one leg is twice as long as the other leg. If one of the legs is the side of the house, and it is 15 m long, find the length of the other leg. Draw a diagram to show the backyard.

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