

Pythagorean Theorem 12 The

Prove the following Theorems and Corollaries.

T12-1 If the altitude is drawn to the hypotenuse of a right triangle, then the two triangles formed are similar to the original triangle and to each other.

C12-1 When the altitude is drawn to the hypotenuse of a right triangle, the length of the altitude is the geometric mean between the segments of the hypotenuse.

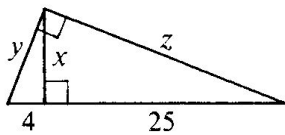
C12-2 When the altitude is drawn to the hypotenuse of a right triangle, each leg is the geometric mean between the hypotenuse and the segment of the hypotenuse that is adjacent to that leg.

T12-2 Pythagorean Theorem In a right triangle, the square of the hypotenuse is equal to the sum of the squares of the legs.

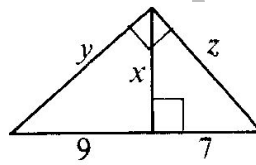
Exercise

Find the values of x , y , and z .

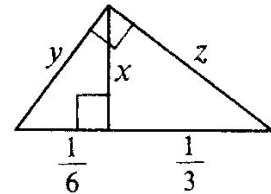
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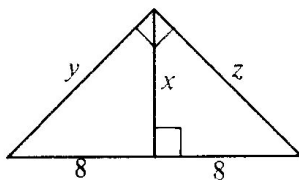
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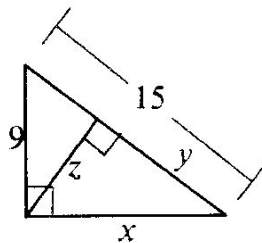
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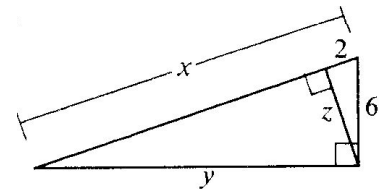
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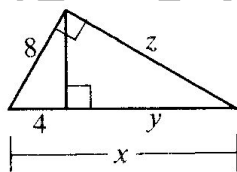
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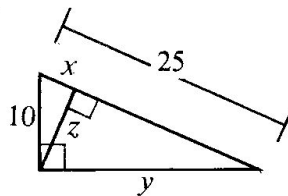
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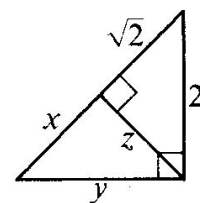
7.



8.



9.



The length of a diagonal of a square is given. Find the length of a side of the square.

10. 2

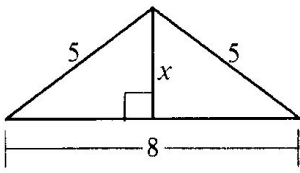
11. 10

12. $20k$

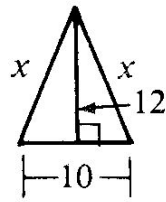
13. $7n\sqrt{2}$

Find the value of x in each figure.

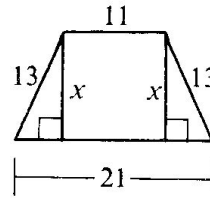
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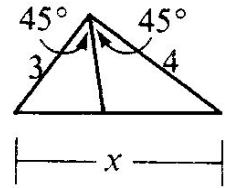
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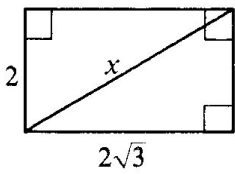
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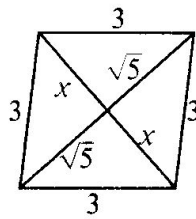
17.



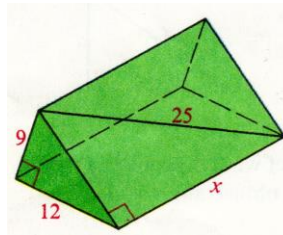
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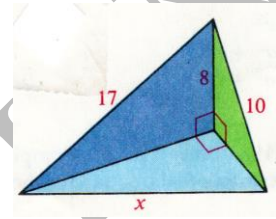
19.



20.



21.



The dimensions of a rectangular box are given. Find the length of a diagonal of the solid.

22. 12, 4, 3

23. $\sqrt{7}, \sqrt{6}, \sqrt{5}$

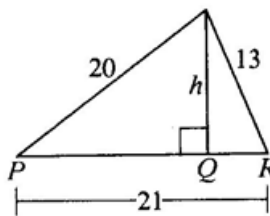
24. e, e, e

25. l, w, h

26. $n+2, \sqrt{2n+1}, 2$

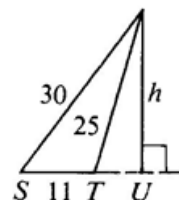
27-28 Find the value of h .

27.



(Hint: Let $PQ = x$; $QR = 21 - x$. Use two right Δ s)

28.



(Hint: Let $TU = x$; $SU = x + 11$.)

*29. O is the center of square $ABCD$ (the point of intersection of the diagonals) and \overline{VO} is perpendicular to the plane of the square. Find OE , the distance from O to the plane of ΔVBC .

