

# GEOMETRY

## The Complete Course

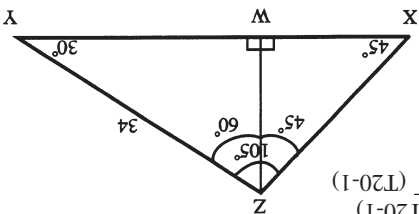
### Lesson Twenty

## Special Right Triangles

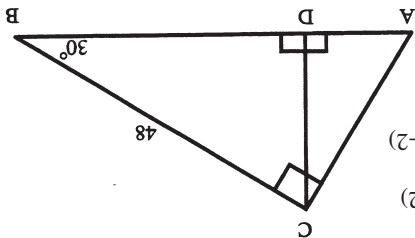
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## Worksheet

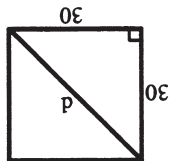
Instructors may duplicate the worksheets as needed



- 16 - 19.  $\angle WZY = 180^\circ - 90^\circ - 30^\circ = 60^\circ$   
 $\angle XZW = 105^\circ - 60^\circ = 45^\circ$   
 $\angle X = 180^\circ - 90^\circ - 45^\circ = 45^\circ$   
 $ZW = 17$  (T20-2)  
 $WY = 17\sqrt{3}$  (T20-2)  
 $XY = 17$  (T20-1)  
 $XZ = 17\sqrt{2}$  (T20-1)



12. 24 (T20-2)  
 13.  $24\sqrt{3}$  (T20-2)  
 14.  $8\sqrt{3}$  (T20-2)  
 15.  $16\sqrt{3}$  (T20-2)



11.  $30^2 + 30^2 = d^2$   
 $900 + 900 = d^2$   
 $1800 = d^2$   
 $30\sqrt{2} = d$   
 Also by (T20-1)

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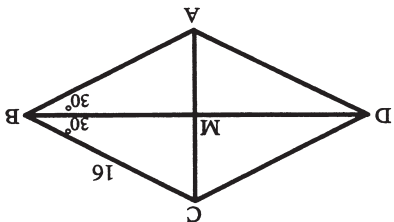


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- 9 & 10. If  $\angle CBA = 60^\circ$ , then  $\angle CBD = 30^\circ$  (T14-8)  
 $AC \perp BD$  (T14-9)  
 Therefore  $\triangle BMC$  is a  $30^\circ - 60^\circ$  Rt.  $\triangle$ .  
 Therefore  $CM = 8$  and  $MB = 8\sqrt{3}$  (T20-2)  
 Therefore  $AC = 16$  and  $BD = 16\sqrt{3}$  (T13-3)



7.  $k = \frac{30}{3}$   
 $k = \frac{\sqrt{3}}{30} \cdot \sqrt{3}$   
 $k = \frac{3}{30\sqrt{3}}$   
 $k = 10\sqrt{3}$   
 8.  $p = 2k$   
 $p = 2(10\sqrt{3})$   
 $p = 20\sqrt{3}$   
 5.  $m = \frac{2}{1}$  (28)  
 $m = 14$   
 6.  $n = m \cdot \sqrt{3}$   
 $n = 14\sqrt{3}$  (T20-2)

2.  $c = 15\sqrt{2}$  (T20-1)  
 3 & 4.  $y = z = \frac{\sqrt{2}}{18}$  (T20-1)  
 $= \frac{\sqrt{2}}{18} \cdot \frac{\sqrt{2}}{\sqrt{2}}$   
 $= \frac{2}{18\sqrt{2}} = y = z$

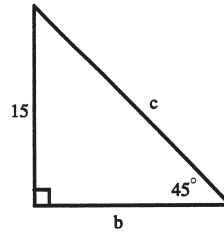
## I. VIDEOTAPE FOLLOW-UP QUESTIONS

- I. Introduction.
- Review of the Pythagorean Theorem and its converse
  - Review of similarity in right triangles.
- III. The  $45^\circ$  - $45^\circ$  - $90^\circ$  right triangle
- Definition
  - Isosceles right triangle
  - In a  $45^\circ$  - $45^\circ$  - $90^\circ$  triangle, the length of the hypotenuse is  $\sqrt{2}$  times the length of the leg. (T20-1)
  - Proof
  - Examples
  - Applications
- III. The  $30^\circ$  - $60^\circ$  - $90^\circ$  Right Triangle.
- Definition
  - In a  $30^\circ$  - $60^\circ$  - $90^\circ$  triangle, the length of the hypotenuse is twice the length of the shorter leg and the length of the longer leg is  $\sqrt{3}$  times the length of the shorter leg. (T20-2)
  - Proof
  - Examples
  - Applications
- IV. The Special Right Triangles in the unit circle.

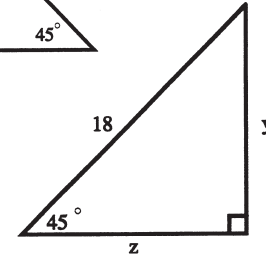
## II. SUPPLEMENTARY EXERCISES

1-8 Find the measures of the missing sides in the following right triangles:

1.  $b = \underline{\hspace{1cm}}$



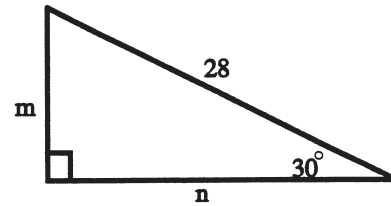
2.  $c = \underline{\hspace{1cm}}$



3.  $y = \underline{\hspace{1cm}}$

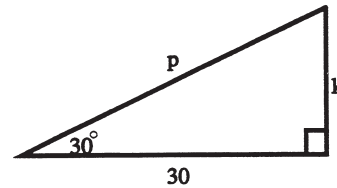
4.  $z = \underline{\hspace{1cm}}$

5.  $m = \underline{\hspace{1cm}}$



6.  $n = \underline{\hspace{1cm}}$

7.  $k = \underline{\hspace{1cm}}$



8.  $p = \underline{\hspace{1cm}}$

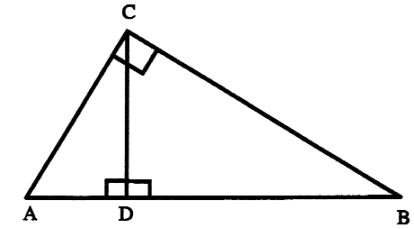
9-10 Given rhombus ABCD,  $\angle CBA = 60^\circ$ ,  $BC = 16$

9.  $AC = \underline{\hspace{1cm}}$

10.  $BD = \underline{\hspace{1cm}}$

11. What is the length of the diagonal of a square if its side has a measure of 30?

12-15 Given right triangle ABC with altitude  $\overline{CD}$ ,  $\angle B = 30^\circ$ ,  $BC = 48$ .



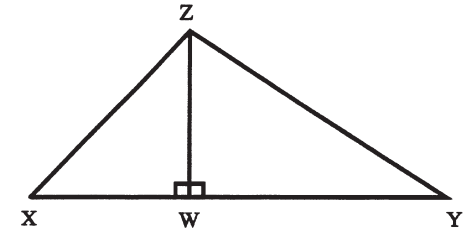
12.  $CD = \underline{\hspace{1cm}}$

13.  $BD = \underline{\hspace{1cm}}$

14.  $AD = \underline{\hspace{1cm}}$

15.  $AC = \underline{\hspace{1cm}}$

16-19 Given obtuse triangle XYZ with altitude  $\overline{ZW}$ ,  $\angle XZY = 105^\circ$ ,  $\angle Y = 30^\circ$ ,  $YZ = 34$ .



16.  $ZW = \underline{\hspace{1cm}}$

17.  $WY = \underline{\hspace{1cm}}$

18.  $XW = \underline{\hspace{1cm}}$

19.  $XZ = \underline{\hspace{1cm}}$