DOCUMENT RESUME

ED 217 293 CE 032 929

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SPONS AGENCY	Employment and Training Administration (DOL), Washington, D.C.; Oregon State Dept. of Education, Salem.
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IDENTIFIERS	*Area (Geometry); Preapprenticeship Programs; *Volume (Mathematics)

ABSTRACT

One of a series of pre-apprenticeship phase 1 training modules dealing with math skills, this self-paced student module covers computation of areas of plane figures and volumes of solid figures. Included in the module are the following: cover sheet listing module title, goals, and performance indicators; introduction; study guide/check list with directions for module completion; information sheet; self-assessment; self-assessment answers; and post assessment. Emphasis of the module is on problems involving determination of the areas of various odd-shaped figures that are encountered by apprentices in the skilled trades. (Other related pre-apprenticeship phase 1 training modules are available separately--see note.) (MN)

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ED217293

INDIVIDUALIZED LEARNING SYSTEMS

PRE-APPRENTICESHIP
PHASE 1 TRAINING

MATH

AREAS OF PLANE FIGURES

VOLUMES OF SOLID FIGURES

CE032927

Goal:

The student will know the necessary math concepts in area of plane figures and volumes of solid figures to enable him or her to compute math problems in which these concepts are used.

Performance Indicators:

Given a series of math problems in the Self Assessment and Post Assessment, Portions of this module, the student will be able to successfully compute the answers.

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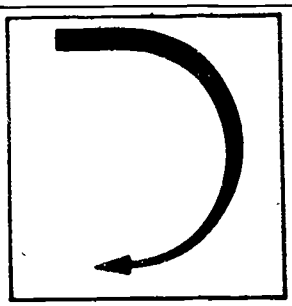
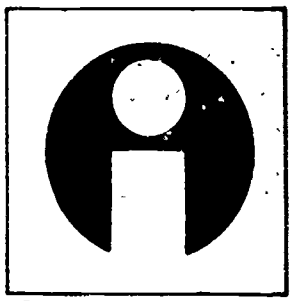


Introduction

The previous modules, specifically the last two, have demonstrated the importance of math and its application in solving problems which apprentices are faced with daily. Some types of mathematical problems have not been covered in the previous modules. This module introduces several new formulas for determining areas and volumes of "out of the ordinary" or add-shaped figures.

Study Guide



This study guide is designed to help you successfully complete this module. Check off the following steps to completion as you finish them.

STEPS TO COMPLETION

1. ____ Familiarize yourself with the Goal and Performance Indicators on the title page of this module.

2. ____ Read the Introduction and study the Information section of the module. It is intended to provide you with the math skills necessary to successfully complete the assessment portions.

3. ____ Complete the Self Assessment section of the module. You may refer to the Information section for help.

4. ____ Compare your Self Assessment answers with the correct answers on the Self Assessment Answer Sheet immediately following the Self Assessment exam. If you missed more than one of the Self Assessment exam questions, go back and re-study the necessary portions of the Information section, or ask your instructor for help. If you missed one or none of these problems, go on to step 5.

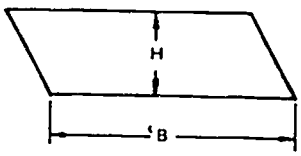
5. ____ Complete the Post Assessment section of the module. Show your answers to the instructor. It is recommended that you score 90% or better on those Post Assessment exams with 10 or more problems, or miss no more than one problem on those with fewer than 10 problems, before being allowed to go on to the next math module.

Information

AREAS OF PLANE FIGURES

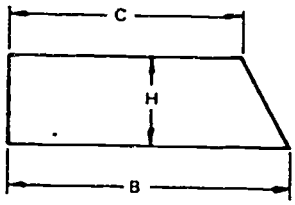
PARALLELOGRAM

$A = B \times H$



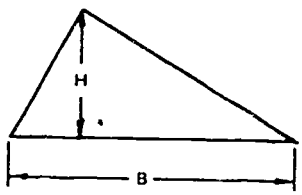
TRAPEZOID

$A = \frac{B + C}{2} \times H$



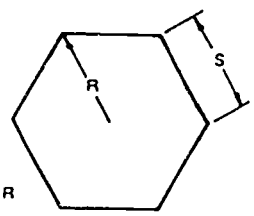
TRIANGLE

$A = \frac{B \times H}{2}$



REGULAR POLYGON

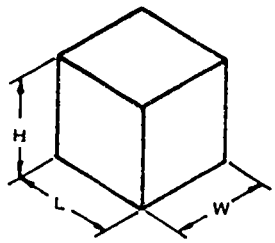
$A = \frac{\text{SUM OF SIDES (S)}}{2} \times R$



VOLUMES OF SOLID FIGURES

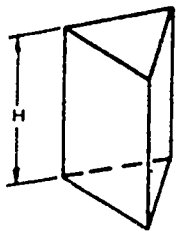
RECTANGULAR SOLIDS

$V = L \times W \times H$



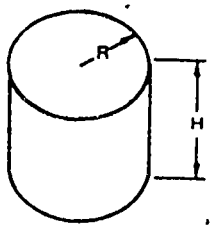
PRISMS

$V = \text{AREA OF END} \times H$



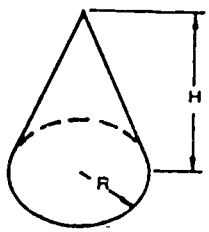
CYLINDER

$V = \pi R^2 \times H$



CONE

$V = \frac{\pi R^2 \times H}{3}$

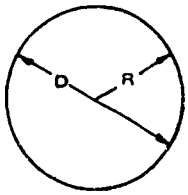


CIRCLE

$A = \pi R^2$

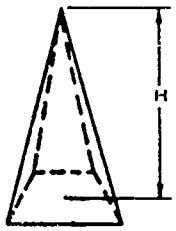
$A = .7854 \times D^2$

$A = 0796 \times C^2$



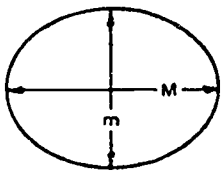
PYRAMIDS

$V = \text{AREA OR BASE} \times \frac{H}{3}$



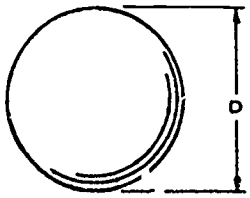
ELLIPSE

$A = M \times m \times .7854$



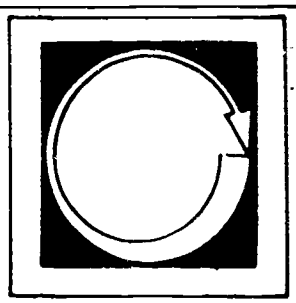
SPHERE

$V = \frac{1}{6} \times \pi D^3$

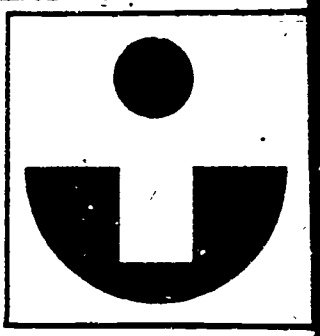


Formulas for calculating areas or volumes of typical geometric shapes.

Self Assessment



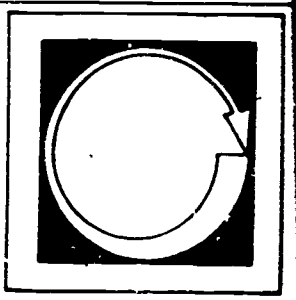
Referring to the Information section, select your own numbers for the various bases, heights, lengths, widths, etc., and work out at least one formula for each of the 12 area and volume figures on the Information sheet.



Self Assessment Answers

The problems completed by students working on this module will be evaluated individually by the instructor.

Post Assessment



Referring to the Information section of this module, answer the following questions.

1. What is the volume of the cylinder if the radius (R) is 6 inches and the height is 8 inches? _____

2. What is the volume of the sphere if D is 11.4 inches? _____

3. What is the area of the regular polygon if each side is 2.5 inches and the R (radius) is 3.6 inches? _____

4. What is the total volume of the cylinder and the cone if the height of each is 9 inches, and the R (radius) of each is 4.5 inches? _____