



Strategic Math Instruction for the GED: Test-Taking Strategies for **Geometry Three-Dimensional Shapes**



Kellie Blair Hardt
Hardt2Heart Adult
Education Services

Kellie Blair Hardt



- Kellie's Story-

- Kellie's Gets a GED
Coloring Book-

- GEDTS
Board Member-

- GED Math Tutor & Board Member @ GED Testing Service
- 20+ years of middle/high school math/science/special education
- 20+ years of adult education, math
- Hardt2Heart Adult Education Services, LLC
- B.A Psychology, M.Ed Special Ed.
- **GED Graduate!**



**If it's in blue, it's for you!*

Session Overview

The Strategy Behind The Score

- Common misconceptions
- Hidden cognitive barriers
- What every GED math instructor should know

Small Instructional Shifts

- Enhancing math engagement with ALT
- Addressing Dyscalculia
- Ready-to-use resources impact
- Hands-on practice

Test-Taking Strategies for 3D Shapes

- Addressing missing points
- Interpreting diagrams
- Using formulas strategically
- Finding missing dimensions
- Using a table to find solutions

The Calculator- A Tool, Not a Crutch

- Reducing cognitive overload
- Checking reasoning
- Increasing confidence & time

Session Overview: Where We've Been

Indicators:

add/subtract
multiply/divide
multiple operations
quadratic equations

Related Indicators:

computing w/linear
expressions
computing w/polynomials
factoring polynomials



ALGEBRAIC COMPUTATIONS

- Roll up your sleeves with algebraic operations
- Quadratic equations
- Factoring polynomials
- The Quadratic Formula



$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$3x^2 + 7x - 6$$

Session Overview: What We're Doing Now

calculate surface area or volume:
when dimensions are given

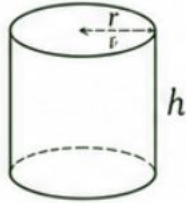
determine dimensions: when
surface area or volume is given
(missing dimensions e.g., length,
height, radius)

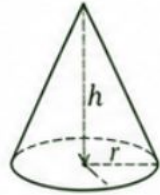
Figures: prisms, cones, cylinders,
spheres

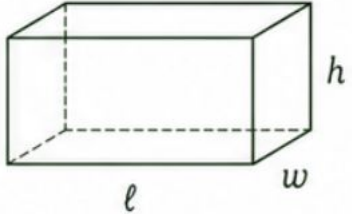


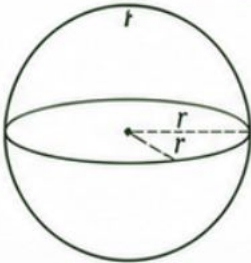
THREE-DIMENSIONAL SHAPES

- Surface area & volume
- Finding missing dimensions (e.g., length, height, radius)
- Cones, cylinders, spheres
- Word problems & understanding geometry vocabulary
- GED Formula Sheet in action









Session Overview: Where We're Going

Indicators

calculate slope from a table, graph or equation

slope-intercept form

Related indicators

graphing equations

unit rate as slope

writing equations from points and/or slope; working with parallel and perpendicular slopes

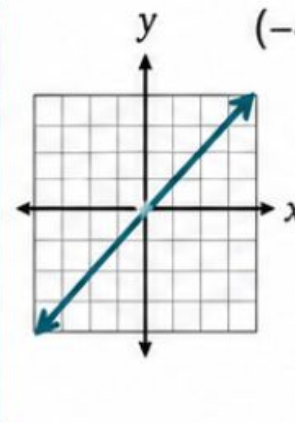


SLOPES / GRAPHING / LINEAR EQUATIONS BASICS

- Slopes from tables, graphs, & equations
- Graphing in slope-intercept form
- Writing equations from points & slopes
- Parallel & perpendicular slopes

$$3y - 15 = -6x$$

$$y = -2x + 5$$



$(-4, -7)$ and $(-6, 9)$

$$y = -8x - 39$$

$$m = 2$$

$$b = 1$$

Small Instructional Shifts That Matter

Enhancing Math Engagement at all Levels

“What are you hoping this session will provide?”

- Details about how the test works
- Specific math concepts on GED Test
- Teaching/Test-taking Strategies

More strategies
to engage
students

Connecting with
students

Classroom Tips
and tricks to
help **students**

Increase
student &
teacher trust

Increasing math
confidence for
students

Student
classroom
management

Small Instructional Shifts

Language shapes how adults experience learning

In an andragogic mindset, the term student is often associated with K–12 environments, where learning is typically teacher-directed and compliance-based.

The term learner, reflects adult education contexts—such as GED programs, workforce training, higher education, and professional learning—where autonomy, experience, and self-direction are central.

Using learner acknowledges adults as active participants in their own learning rather than passive recipients of instruction.

Small Instructional Shifts

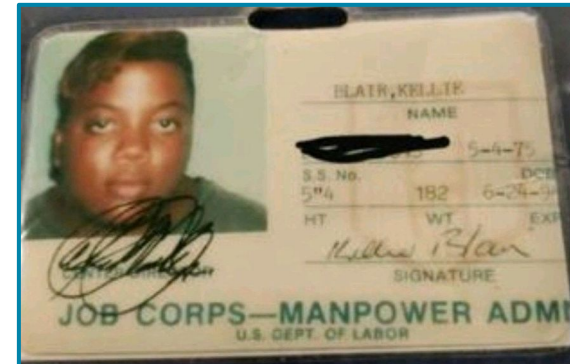
Language shapes how adults experience learning

Experience is Everything

Adult learners were once students.

For some, the term *student* may carry associations with:

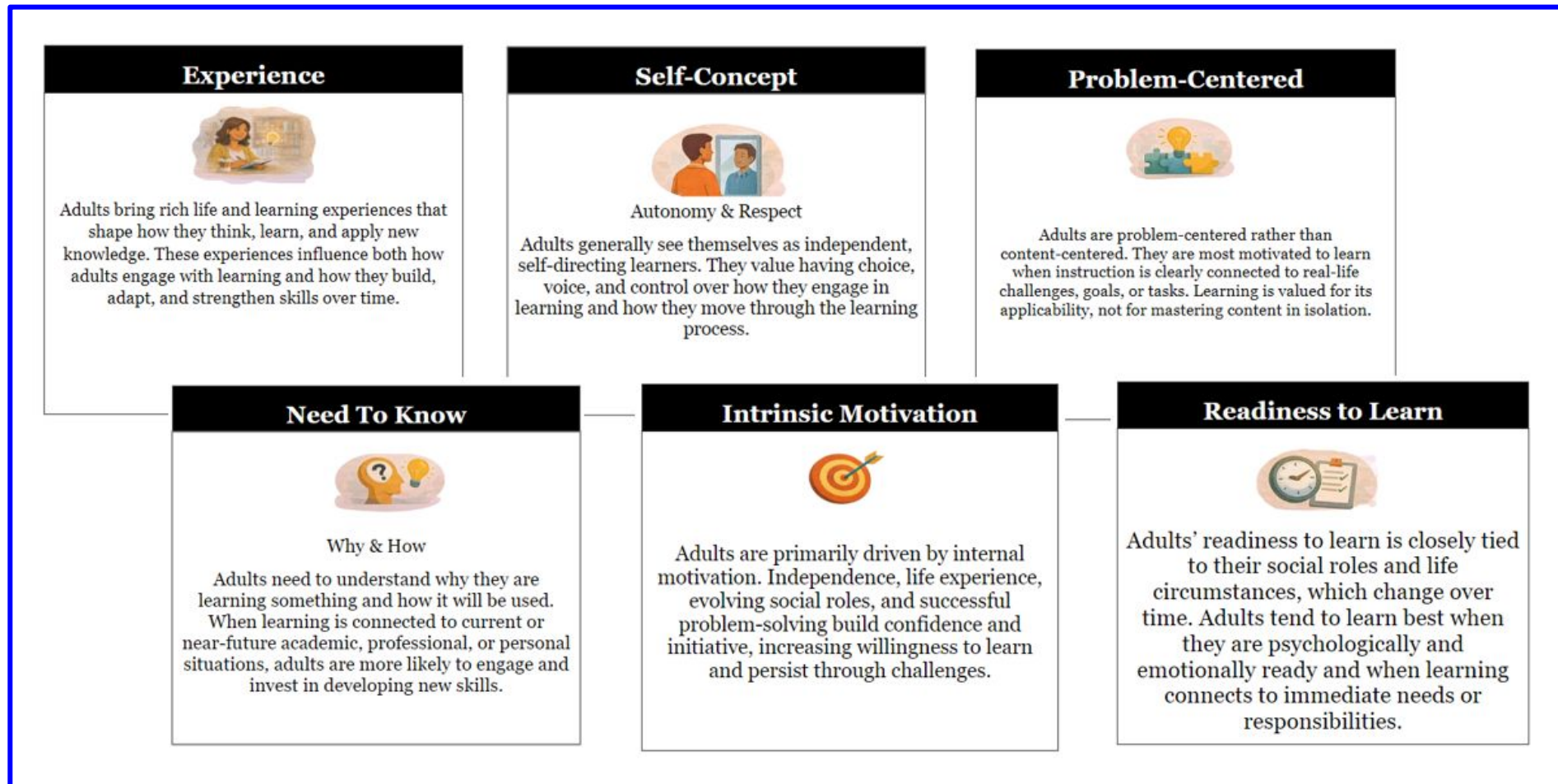
- Past academic failure
- Shame or embarrassment
- Lack of voice or control
- Being labeled, tracked, or underestimated



Because of these experiences, language and actions that echoes K-12 schooling can unintentionally trigger resistance, disengagement, or self-doubt—even when instruction is well-intentioned.

Small Instructional Shifts

Adult Learning Theory in the GED Math Classroom



Small Instructional Shifts

Dyscalculia in the GED Math Classroom

Dyscalculia is a specific learning difference that affects a person's ability to understand, process, and work with numbers and mathematical concepts.

In adult education, it may impact a learner's ability to perform calculations, estimate quantities, recognize numerical patterns, understand place value, interpret graphs, manage time, or apply math in everyday situations, despite having average or above-average intelligence and adequate instruction.



The Strategy Behind the Score

Winning Before the Math Begins

The Strategy Behind the Score

Why Strategy Matters

As of February, 2026:

208,999 adult learners have passed 3 of the 4 required GED tests
and never finished the final test

166,235 learners/ 80% need to complete Math

- **High Impact Indicators**
- **Math anxiety**
- **Cognitive overload**
- **Lack of strategy**
- **Lack of connection**
- **Lack of confidence**

The Strategy Behind the Score



EVERY QUESTION COUNTS

- ✓ Questions are **not weighted** differently—each typically counts **equally** toward the final score.
- ✓ It's not about doing the hardest problems—it's about answering **as many correctly as possible**, no matter the type.



**Accuracy + Efficiency
+ Strategy = Success**



NO PENALTY FOR WRONG ANSWERS

- ✓ Wrong answers **do not count** against you.
- ✓ The GED Math test measures what you **know**, not what you don't.
- ✓ Only **correct** answers count toward your score.
- ✓ There's **no penalty for guessing**. So even if you're unsure—take your best shot! Leaving answers blank means missing out on points.



"THREE MINUTES TO WIN IT!" STRATEGY



Prioritize Questions: Start with questions that can be answered quickly. This builds confidence and saves time.



Choose & Flag: If a question takes longer than three minutes, choose an answer, flag it, and move on. If there's time, come back to it later.



Watch the Clock: Keep an eye on the clock. With the "three minutes to win it" strategy, you'll have plenty of time to go back, review, and pick up more points.

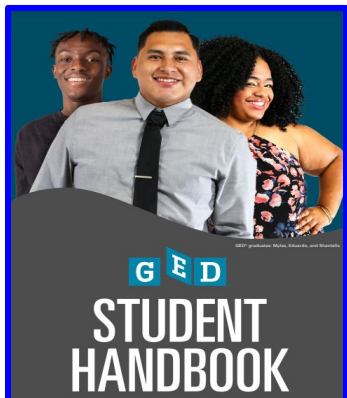
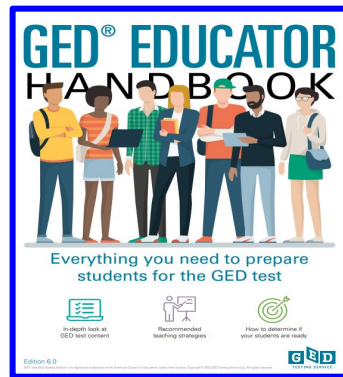
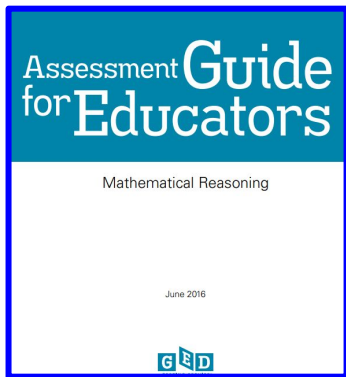
The Strategy Behind the Score

5 Things Every GED Math Instructor Should Know

1. Think like an adult learner, not a mathematician
2. Teach test-taking strategies, in addition to traditional math instruction.
3. Provide and practice the [-formula sheet-](#) in class often, especially geometry vocabulary, no matter content level of class.
4. Create your own learner account using last name as “**CANDIDATE.**” –non school email.
5. Take the [GED READY PRACTICE TEST](#) several times & explore [GED FLASH](#).

The Strategy Behind the Score

Toolbox Every Great GED Math Instructor Needs



- all resources for educators & admin-



The Calculator- A Tool, Not a Crutch

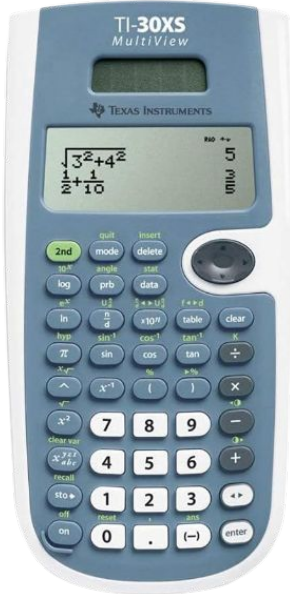
Teaching Strategies Build Understanding. Test-Taking Strategies Build Opportunity.

Test-Taking Strategies for 3D Shapes

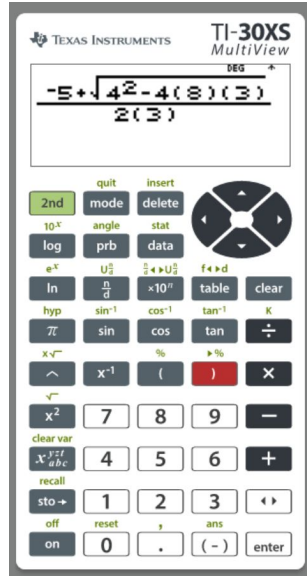
Teaching Strategies Build Understanding. Test-Taking Strategies Build Opportunity.

The Calculator- A Tool, Not a Crutch

TI-30XS Multiview: The Right One Counts

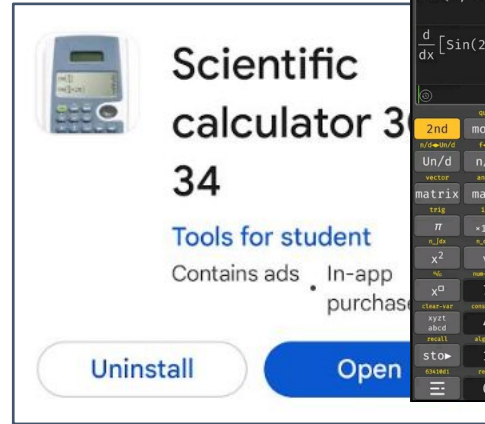


-Hand held-



-Computer
Emulator -

-TI-30xs Guide
for Teachers-



-Android Google Play-

-GED calculator
reference sheet-



-Free web based for
computers, Android, iPhone
(ads)-

Test-Taking Strategies For 3D Shapes

CALCULATOR SKILLS

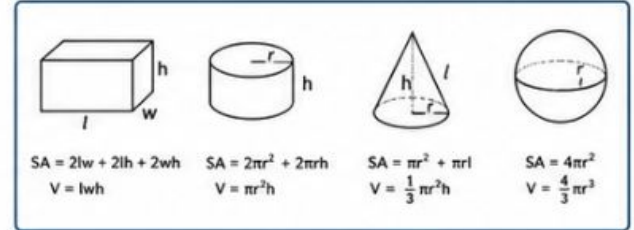
- $\frac{a}{b}$ Fractions
- .25 Decimals
- % Percents
- +/- Integers
- PEMD ASS Order of Operations
- x^2 Powers & Roots
- Data & Table Buttons
- And More!



HIGH IMPACT INDICATORS – GEOMETRY

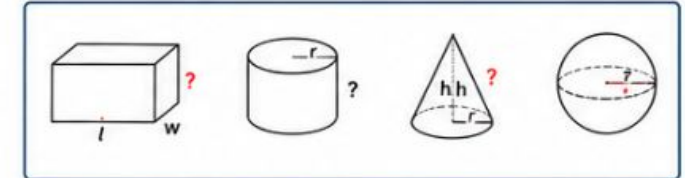
1 FORMULA BASICS – SURFACE AREA & VOLUME OF COMMON SHAPES

Rectangular Prisms • Cylinders • Cones • Spheres
Includes finding a missing side of a cone



2 FINDING MISSING DIMENSIONS

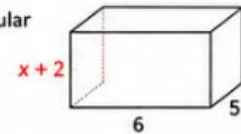
Length • Width • Height
Radius • Diameter
Using given surface area or volume



3 SUBSTITUTING SOLUTIONS

Plug in answer choices
Reverse engineer solutions
Process of elimination

The volume of the rectangular prism is 240 cubic units.
What is the value of x?

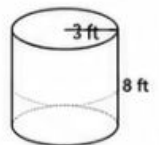


- A. 2
- B. 4**
- C. 6
- D. 8

4 ANALYZING WORD PROBLEMS

Understand vocabulary
Surface area vs. volume
Identify the shape
Connect words to diagrams

The water in a cylindrical tank is up to a height of 8 feet. If the radius of the tank is 3 feet, what is the volume of water in the tank?



Test-Taking Strategies For 3D Shapes

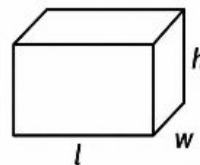
Roll-up Your Sleeves!

Strategies for:

FORMULA FUNDAMENTALS W/CALCULATOR

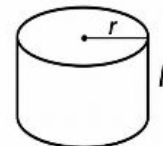
Formula Fundamentals w/Calculator Practice

- Surface area & volume
- Rectangular prisms
- Cylinders
- Cones
- Finding the missing side of a cone



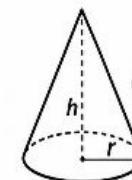
$$SA = 2lw + 2lh + 2wh$$

$$V = lwh$$



$$SA = 2\pi r^2 + 2\pi rh$$

$$V = \pi r^2 h$$



$$SA = \pi r^2 + \pi rl$$

$$V = \frac{1}{3}\pi r^2 h$$



Find the Surface Area



Find the Surface Area

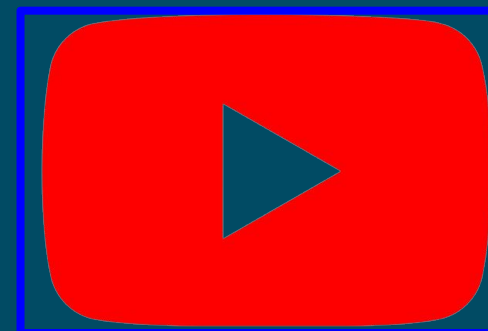
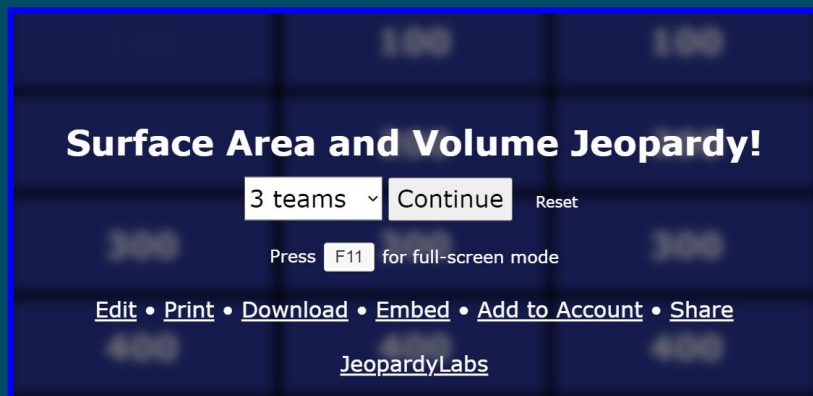
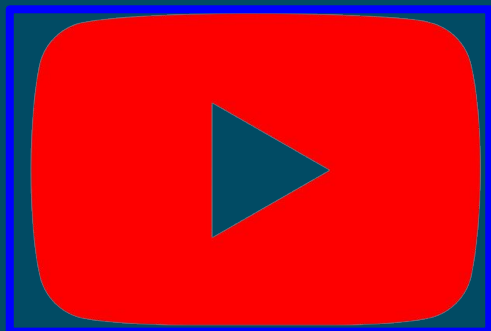


Find the Surface Area

Test-Taking Strategies For 3d Shapes

Roll-up Your Sleeves!

RESOURCES: FORMULA FUNDAMENTALS W/CALCULATOR



Test-Taking Strategies For 3D Shapes

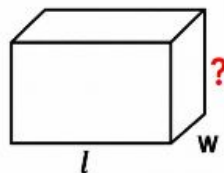
Roll-up Your Sleeves!

Strategies for:

FINDING MISSING DIMENSIONS

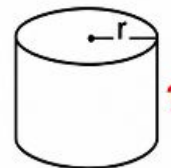
Finding Missing Dimensions

- Length
- Width
- Height
- Radius
- Diameter
- Using given surface area or volume



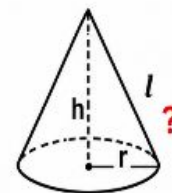
$$SA = 2lw + 2lh + 2wh$$

$$V = lwh$$



$$SA = 2\pi r^2 + 2\pi rh$$

$$V = \pi r^2 h$$



$$SA = \pi r^2 + \pi rl$$

$$V = \frac{1}{3} \pi r^2 h$$



What is the missing height?



Find the missing width

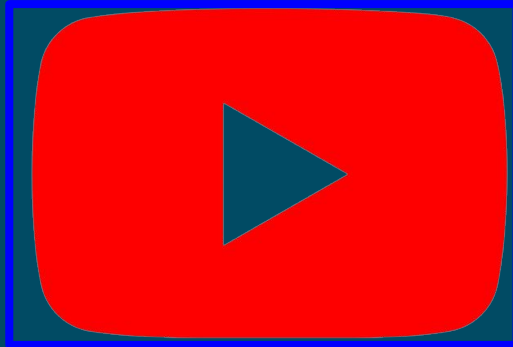


Find the missing diameter

Test-Taking Strategies For 3d Shapes

Roll-up Your Sleeves!

RESOURCES: FINDING MISSING DIMENSIONS



ROLL UP YOUR SLEEVES PRACTICE
FIND THE MISSING DIMENSION
OF EACH RECTANGULAR PRISM.

REMEMBER: Use the given Surface Area and Volume to find the missing dimension.

- Surface Area = 558 ft²
Volume = 840 ft³
Surface Area: $x =$ _____ ft
Volume: $x =$ _____ ft
- Surface Area = 222 in²
Volume = 215 in³
Surface Area: $x =$ _____ in
Volume: $x =$ _____ in
- Surface Area = 791.5 cm²
Volume = 1,275 cm³
Surface Area: $x =$ _____ cm
Volume: $x =$ _____ cm
- Surface Area = 258 ft²
Volume = 270 ft³
Surface Area: $x =$ _____ ft
Volume: $x =$ _____ ft

ROLL UP YOUR SLEEVES PRACTICE
FIND THE MISSING DIMENSION
OF EACH CYLINDER.

REMEMBER: Use the given Surface Area and Volume to find the missing dimension.

- Surface Area = 502.65 in²
Volume = 600 in³
Surface Area: $h =$ _____ in
Volume: $h =$ _____ in
- Surface Area = 394.84 cm²
Volume = 471.24 cm³
Surface Area: $r =$ _____ cm
Volume: $r =$ _____ cm
- Surface Area = 615.75 ft²
Volume = 1,178.1 ft³
Surface Area: $h =$ _____ ft
Volume: $h =$ _____ ft
- Surface Area = 153.94 in²
Volume = 96.21 in³
Surface Area: $r =$ _____ in
Volume: $r =$ _____ in

PRACTICE TIME!
FIND THE MISSING DIMENSION
OF EACH CONE.

REMEMBER: Use the given Surface Area and/or Volume to find the missing dimension.

- Surface Area = 339.29 ft²
Volume = 502.65 ft³
Surface Area: $h =$ _____ ft
Volume: $h =$ _____ ft
- Surface Area = 153.94 cm²
Volume = 96.21 cm³
Surface Area: $h =$ _____ cm
Volume: $h =$ _____ cm
- Surface Area = 301.59 in²
Volume = 301.59 in³
Surface Area: $x =$ _____ in
Volume: $x =$ _____ in

Test-Taking Strategies For 3D Shapes

Roll-up Your Sleeves!

Strategies for:

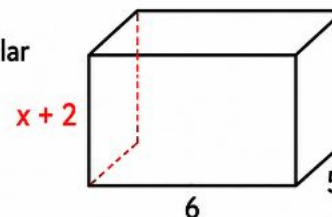
USING A TABLE TO FIND SOLUTIONS

Working Backward w/Calculator Strategies

- *Substitute answer choices*
- *Reverse engineer solutions*
- *Process of elimination*

The volume of the rectangular prism is 240 cubic units.

What is the value of x ?



- A. 2
- B. 4**
- C. 6
- D. 8



Use a table to determine surface area



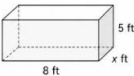
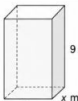
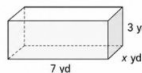
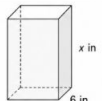
Find the missing dimension using a table

Test-Taking Strategies For 3d Shapes

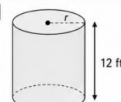
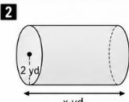
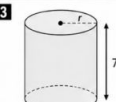
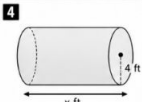
Roll-up Your Sleeves!

RESOURCES: USING A TABLE TO FIND SOLUTIONS

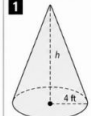
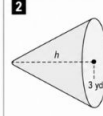
SURFACE AREA OF RECTANGULAR PRISMS – FIND THE MISSING DIMENSION USING A TABLE
The surface area of each prism is given. What is x ?

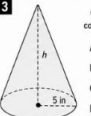
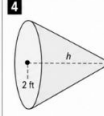
1  The surface area is 184 ft^2. What is x?	2  The surface area is 174 m^2. What is x?	3  The surface area is 142 yd^2. What is x?	4  The surface area is 188 in^2. What is x?
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VOLUME OF CYLINDERS – FIND THE MISSING DIMENSION USING A TABLE
Choose the correct answer.

1  Volume = 339.1 ft^3, what is the radius, r? A. 2 ft B. 3 ft C. 4 ft D. 5 ft	2  Volume = 62.8 yd^3, what is the height, x? A. 3 yd B. 4 yd C. 5 yd D. 6 yd	3  Volume = 549.5 in^3, what is the radius, r? A. 4 in B. 5 in C. 6 in D. 7 in	4  Volume = 301.4 ft^3, what is the height, x? A. 4 ft B. 5 ft C. 6 ft D. 7 ft
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VOLUME OF A CONE USING A TABLE

MISSING HEIGHT (h) (Use a table – Linear)	MISSING RADIUS (r) (Use a table – Quadratic)
1  Choose the correct answer. A. 2 ft B. 3 ft C. 4 ft D. 6 ft Volume = 100.5 ft^3, what is the height, h?	2  Choose the correct answer. A. 4 yd B. 6 yd C. 8 yd D. 12 yd Volume = 113.1 yd^3, what is the height, h?

3  Choose the correct answer. A. 3 in B. 4 in C. 6 in D. 9 in Volume = 157.0 in^3, what is the height, h?	4  Choose the correct answer. A. 6 ft B. 9 ft C. 12 ft D. 18 ft Volume = 37.7 ft^3, what is the height, h?
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Test-Taking Strategies For 3D Shapes

Roll-up Your Sleeves!

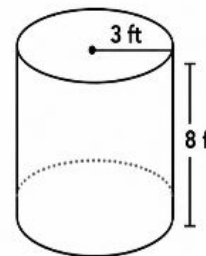
Strategies for:

ANALYZING WORD PROBLEMS

Analyzing Word Problems

- *Interpreting geometry vocabulary*
- *Identifying the shape*
- *Connecting words to diagrams*

The water in a cylindrical tank is up to a height of 8 feet. If the radius of the tank is 3 feet, how much water can the tank hold?





A gift box must hold 2,400 cubic inches of confetti.

The box is 10 in. wide and 12 in. tall.

What length should the box be?



A soup company wants each can to hold 400 mL.

The height of the can is 10 cm.

What radius should they manufacture?



An ice cream cone must hold 75 cubic inches of soft-serve.

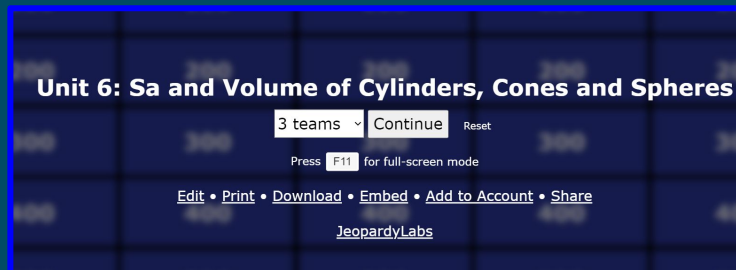
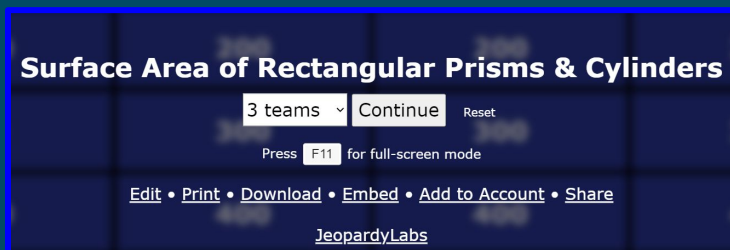
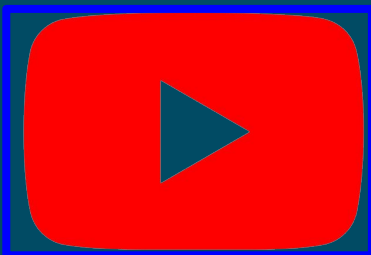
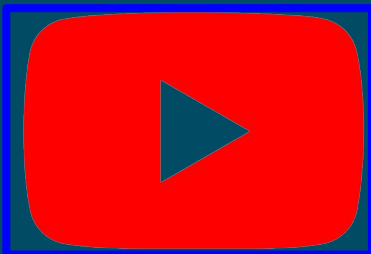
The radius of the opening is 3 inches.

What height should the cone be?

Test-Taking Strategies For 3d Shapes

Roll-up Your Sleeves!

RESOURCES: ANALYZING WORD PROBLEMS



Don't Forget This...Also in the packet

ADDITIONAL CALCULATOR PRACTICE:

How do you input fractions?

Press $\frac{n}{d}$ button

Key in numerator

Push down arrow

Key in denominator

Push 

Solve: $\frac{7}{8} + \frac{1}{3} =$

- Answer is $\frac{29}{24}$

You have entered $5 * 6 + 2$ but want to change the 6 to a 3.

1. Push the left arrow  on the oval until you get to 6

2. Key in 3 where the 6 is blinking

3. Press enter

How do you enter an exponent?

1. Enter the base number
2. Press $\wedge$ (middle of far left row)
3. Enter exponent
4. Press enter

What is 9^4 ?

- Answer is 6561

How do you access the green functions?

- Press 2^{nd}

Find the square root of 784

1. Press 2^{nd}
2. Press x^2
3. Key in 784
4. Press enter

- Answer is 28.

Table Check

Use table for:

$$y = 2x - 1$$

Find y when $x = 3$

1. Press table
2. Enter $2x-1$
3. Scroll to $x = 3$
- Answer is 5

Table Value

Use table for:

$$y = 3x + 2$$

Find y when $x = 4$

1. Press table
2. Enter $3x + 2$
3. Scroll to $x = 4$
- Answer is 14

How do you find cube roots?

1. Press 3
2. Press 2^{nd}
3. Press $\wedge$
4. Key in number
5. Press enter

Solve: $\sqrt[3]{216} =$

- Answer is 6

How do you input mixed numbers?

1. Press 2^{nd} button
2. Press $\frac{n}{d}$ button
3. Key in whole number
4. Push 
5. Key in numerator
6. Push down arrow
7. Key in denominator
8. Push 

Solve: $3\frac{1}{5} + 2\frac{2}{7} =$

- Answer is $\frac{192}{35}$

*Convert to Mix Number

What's the difference between $(-3)^2$ and -3^2

$$(-3)^2 = 9$$

$$-3^2 = -9$$

- Use parenthesis to solve negative exponents!

Enter the function $y = x + 3$. What are y values when x is -2, -1, 0, 1?

1. Press table
 2. Enter $x + 3$ (x is left of 4 button)
 3. Press enter until it goes to a chart
 4. Use  
- Answers:
(-2,1)(-1,2)(0,3)(1,4)

SESSION SURVEY & THANK YOU!

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