Teaching Calculations

More than the Right Answer?

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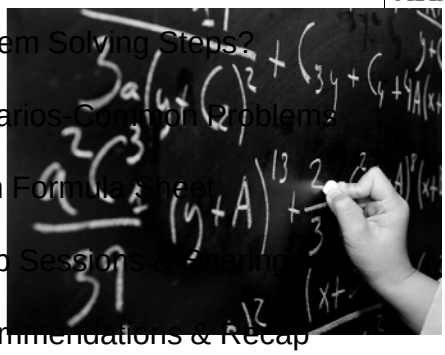
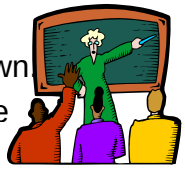
Overview and Purpose



- Problem Solving Steps?
- Scenarios-Common Problems
- Exam Formula Sheet
- Group Sessions & Sharing
- Recommendations & Recap

Calculations: How Do We Learn?

- Who are your students-What is their level of knowledge?
- Connect unknown to known.
- Provide hands-on practice whenever possible.
- Design training to consider tactile, auditory, visual learning.
- Be approachable-allow time for those needing extra help & practice.



Calculations: Problem Solving Steps

Going Undercover For Info on Cute Cowgirls (or Cowboys)!!!

Calculations: Problem Solving Steps

- Given- What do you know?
- Unknown- What are you trying to find?
- Formulas- Which one(s) to use?
- Illustrate-Draw picture or diagram
- Calculate-Solve problem using numbers with units-(no naked numbers)
- Check-Is answer reasonable/ realistic?

Problem Solving Steps: Problem

For example:

What is the flow in cubic feet per second in a 12-inch pipe if the velocity is 2.5 ft/s?

Problem Solving Steps: Given

For example:

What is the flow in cubic feet per second in a 12-inch pipe if the velocity is 2.5 ft/s?

Given: 12-inch diameter pipe
velocity= 2.5 ft/s

Problem Solving Steps: Unknown

For example:

What is the flow in cubic feet per second in a 12 inch pipe if the velocity is 2.5 ft/s?

Unknown: flowrate = ? cubic feet per second (ft^3/s)

Problem Solving Steps: Formulas

$Q = A \times v$

Where:

Q = the flow in cubic feet per second

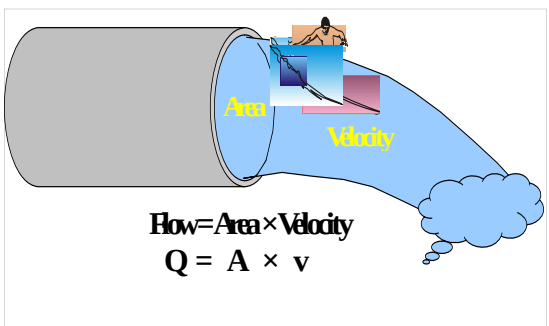
A = the cross sectional area of the flow in square feet (ft^2)

v = the velocity in feet per second (ft/s)

Also:

$A = \pi \times r^2$, where r = radius in feet

Problem Solving Steps: Illustrate



Problem Solving Steps: Calculate

Given diameter, find radius for area:

r = Diameter ÷ 2 = 12 inches ÷ 2 = 6 inches

Convert inches to feet:

r = 6 inches = 6 inches ÷ 12 inches = .5 ft

$A = \pi r^2 = 3.14 \times .5\ ft \times .5\ ft = 0.785\ ft^2$

Problem Solving Steps: Calculate, then Check

Calculate & Solve:

$Q = A \times v$

$Q = 0.785\ ft^2 \times 2.5\ ft/sec$

$Q = 1.96\ ft^3/sec$

Know the proper units for v, Q, A.

Check:

Is the answer reasonable?

Check your work again.

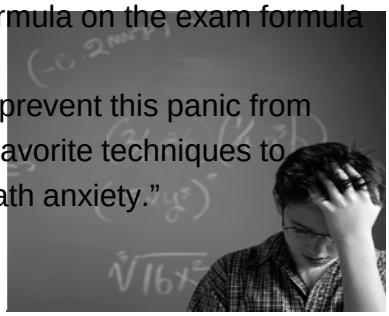
Calculations: Scenario #1

An operator has just failed a licensing examination and wants to discuss how to work a specific math question as best as she can recall from the exam. How should you handle?

Calculations: Scenario #2

An operator panics when he can not find his favorite formula on the exam formula sheet.

How can you prevent this panic from happening? Favorite techniques to overcome "math anxiety."



Calculations: Group Activity

Groups will be given a math problem.

10-15 minutes to discuss-

- the best way(s) to teach the problem.
- common mistakes solving the problem & how to overcome.
- apply problem solving steps

Prepare to present results

(group consensus not necessary)

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Recap-Summary

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