

Problem Solving Cheat Sheets

Problem Solving Cheat Sheets provide you with a series of chart to use as tools for teaching your students problem-solving, organizational and logic skills in the context of specific types of word problems. These Cheat Sheets include most of the types of math problems found on the SAT and ACT tests.

You can make overhead transparencies of the cheat sheets to help your students understand the concepts and their application.

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***Problem Solving
Cheat Sheet 6***

***Time, Rate and Distance
Problems***

Sample problem:

- Two trains started toward each other at the same from stations 732 km apart. One train traveled at 148 km/h and the other train traveled at 96 km/h. In how many hours did they meet?

Procedure:

1. Fill out the chart.	Distances are $148t$ and $96t$
2. Write the equation(s).	$148t + 96t = 732$
3. Solve the equation(s).	$t = 3$ hours

Time, Rate, and Distance - Charts

	rate	time (t)	distance (d)
faster train	148	t	$148t$
slower train	96	t	$96t$
Distance of faster train + distance of slower train = total distance			
	$148t$	+	$96t$
			= 732
			$244t = 732$
			$t = 3$ hours

	rate	time (t)	distance (d)

***Problem Solving
Cheat Sheet 10***

Coin Problems

Sample problem:

- The number of dimes in Jane's collection is 4 less than the number of nickels and the number of quarters is 3 times the number of dimes. If the value of her collection is \$7.40, how many nickels, dimes and quarters does she have?

Procedure:

1. Convert the value of the items to a common unit.	nickels = n ; dimes = $n-4$; quarters = $3(n-4)$
2. Determine the number of each item of the mixture.	nickels = $5 \cdot n$; dimes = $10(n-4)$; quarters = $25(3(n-4))$
3. Write the equation and solve.	$90n = 1080$; $n = 12$

Coin Problems - Charts

Convert the value of the items to a common unit:

Item 1	Item 2	Item 3	Value
$n = \text{nickels}$	$n - 4 = \text{dimes}$	$3(n-4) = \text{quarters}$	
$\text{nickels} \cdot 5$	$\text{dimes} \cdot 10$	$\text{quarters} \cdot 25$	
$5n$	$10 \cdot (n-4)$	$25 \cdot 3(n-4)$	740
$5n$	$+ 10n - 40$	$+ 75n - 300$	$= 740$
$90n - 340 = 740$			
$90n = 1,080$			
$n = 12$			
$n = \text{nickels}$	$n - 4 = \text{dimes}$	$3(n-4) = \text{quarters}$	
12 nickels	8 dimes	24 quarters	

***Problem Solving
Cheat Sheet 14***

Volume - Cylinders

Sample Problem:

A cylindrical can of popped corn has a volume of 6760 cubic centimeters. The height of the can is 40 centimeters. What is the radius of the can?

Formulas:

Area of a circle: **πr^2**

Volume of a cylinder: **$\pi r^2 h$**

Give your answers in terms of π .

Volume of Cylinders - Chart

radius	height	πr^2	Volume = $\pi r^2 h$
r	40	πr^2	6760π
$V/h = \pi r^2$ $6760\pi/40 = \pi r^2$ $169\pi = \pi r^2$ $r^2 = 169$ $r = 13$			

***Problem Solving
Cheat Sheet 20***

***Pythagorean Theorem
Problem Solving***

The Pythagorean Theorem states that where 'a' = the altitude and 'b' = the base and 'c' = the hypotenuse:

$$a^2 + b^2 = c^2$$

Sample Problem:

- The longer leg of a right triangle is 3 inches longer than the length of the shorter leg. The hypotenuse is 15 inches long. Find the length of the shorter leg.

Procedure:

1. Fill out the chart.
2. Write the equation (function).
3. Solve the equation. Be sure your answer fits the criteria given in the problem.

Pythagorean Theorem - Chart

a	b	c	a²	b²	c²
x	x + 3	15	x ²	x ² + 6x + 9	225
$x^2 + (x^2 + 6x + 9) = 225$ $2x^2 + 6x - 216 = 0$ $x^2 + 3x - 108 = 0$ Factor or graph: (x - 9 = 0; x + 12 = 0) x = 9 (x = - 12 is not possible. A length cannot be negative.)					