**Unit 3 Study Guide**

**Cost Per-Unit, Multi-Step Equations and f(x) = g(x)**

Cost Per Unit

Cost per unit problems ask for you to find the value of one unit of an item, given the value of several units of that item. In these problems you follow a simple formula:

$$\frac{total price}{item ammount}$$

Once you find the unit price of an item, you might be asked to compare several items or figure out how much you could save if you purchased several items. In each case it is important to identify what the question is asking, and then find your answer. But, in all of them, you will need to first find the cost per unit!

**>Cost Per Unit Example Problems:**

|  |
| --- |
| 1. A 36-ounce box of cookies cost $3.84. What is the unit price of the cookies?
 |
| 1. An 8-ounce package of crackers costs $2.48. At the same unit price, how does it cost for a 24-ounce package of crackers?
 |
| 1. Ms. Pitts went to the store to buy beakers. The following packages of beakers are available at the store:

 3 beakers for $5.70 4 beakers for $7.20Ms. Pitts needs to buy 75 beakers. How much money will she save by purchasing 75 beakers in packages with the lowest unit price compared to the highest unit price? |
| 1. Alfonso compared the price of blank CDs at four different stores. Which stores sells the CDs at the lowest price per CD?

a. Store W sells 50 CDs for $6.00.b. Store X sells 75 CDs for $11.25.c. Store Y sells 100 CDs for $11.00.d. Store Z sells 150 CDs for $15.00. |
| 5. Coach Clark will order basketball uniforms from one of the stores listed below.• Store A sells 15 uniforms for a total of $429.75.• Store B sells 10 uniforms for a total of $290.00• Store C sells uniforms for $30 per uniform.• Store D sells 2 uniforms for a total of $55.90Which store has the lowest price per uniform? |
| 1. Vacation Packages

|  |  |
| --- | --- |
| Days | Cost |
| 6 | $1,260 |
| 10 | $1,955 |
| 14 | $2,870 |
| 21 | $4,410 |

1. Which number of days gives the best unit price

 **Solution: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**1. Which number of days gives the same unit price?

 **Solution: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** |
|  |
| 1. Soda Prices

|  |  |
| --- | --- |
| Size | Cost |
| 12 fl oz | $1.08 |
| 32 fl oz | $2.56 |
| 64 fl oz | $7.04 |
| 128 fl oz | $12.80 |

1. Which size has the best price per fluid ounce?

 **Solution: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**1. Which size has the most expensive price per fluid ounce?

 **Solution: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** |

**> Combining Like Terms and Solving for X:**

First, distribute to get rid of parenthesis then identify your x terms and your constants (box x’s, circle constants). Then combine all like terms on the right of the equation and combine all like terms on the left of the equation (pay attention to the sign to indicate what to do!). Once your like terms are combined, use inverse operations to combine terms with a variable, and solve for your variable.

|  |
| --- |
| 1. ¾x – 4.5 + 12x – 12 = 15x – 7 + 30x + 5
 |
| 1. -5x + ¼ - 15 – 15x = 3x – 14 + 7x – 10
 |
| 1. -30 + 10x – 20 – 15x = -8 + 12x – 18 + 8x
 |
| 1. 6y – 16 + 10y – 4y = -15 – 5y + 8y
 |
| 1. 9x – 20 + 12x – 14 – 10 = 5x – 7x + 9 – 10
 |

**>Multi-Step Equations**

With Multi-Step Equations it can be hard to know where to start…. pretend it’s a party!

You are the host - a.k.a. ‘X’

In what order do people leave a party?

* + **Enemies** *(get rid of them to avoid trouble)- always being multiplied by something in parenthesis!*
		- **Get rid of by multiplying both sides by the reciprocal!**
	+ **Acquaintances** *(after mingling with everyone, they usually leave early) – always being divided!*
	+ **Friends** *(they hang out with the host a little longer)- being added or subtracted!*
	+ **Family** *(if attending, they will stay to the end to help clean) – being multiplied or divided!*

Steps:

1. **Identify the party-goers**
2. **Eliminate party-goers in order**
3. **Get x (the host) alone**
4. **Check your solution**

Identify all the people at the party: $\frac{1}{5}$ ($\frac{4+3x}{5}$) = 6

\*\* remember, not all parties will have the same people!\*\*

**Multi-Step Equation Example Problems**

|  |
| --- |
| 1. $\frac{4x-5 }{2}$ = 8
 |
| 1. $\frac{-2x-6}{-14}$ = 20
 |
| 1. $\frac{2}{5}$= $\frac{0.5x-0.75}{-4}$
 |
| 1. $\frac{1}{2}$ ($\frac{2x-6}{3}$)= 15
 |
| 1. $\frac{3}{4}$ = $\frac{1}{2}$ ($\frac{-7x+4}{-6}$)
 |

**>f(x) = g(x)**

In f(x) = g(x) problems, you will be given two expressions. Set the two expressions equal to one another, and solve for the variable. Once the two expressions are equal to one another, these problems will look very similar to multi-step equation party problems we just solved!

In these problems it is important to remember, to GET RID OF FRACTIONS FIRST(break down and reduce to decimals!

|  |
| --- |
| 1. Given: f(x) = $\frac{x}{4}$ & g(x) = $\frac{4x-1 }{5}$ If f(x) = g(x), what is the value of x?
 |
| 1. Given: f(x) = 2.1x + 2.5 & g(x) = 4(8.5x – 7.4) What is the solution to f(x) = g(x)?
 |
| 1. Given: f(x) = $\frac{x+6}{2}$ & g(x) = 5.65x + 12 What is the solution to f(x) = g(x)?
 |
| 1. Given: f(x) = $\frac{2x-7 }{4}$ & g(x) = 20x +15.5 What is the solution to f(x) = g(x)?
 |
| 1. Given: f(x) = 3(8.9x + 0.2) & g(x) = 4.8x + 28 What is the solution to f(x) = g(x)?
 |
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