





## DIG INTO EXPRESSIONS: THE PIZZA PLACE

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## In this session, we will explore a context that helps students:

- Build meaning for variables, expressions, and equations
- Use sense-making strategies, such as substitution, to determine if a solution makes an equation true.

#### THE PIZZA PLACE



Menu Item	Price
Pizza Slice	
Cheese	\$1.00
Pepperoni	\$1.25
Drinks:	
Small	\$0.95
Medium	\$1.20
Large	\$1.60
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(Assume that tax is included)

#### Pizza Slice:

Cheese	С
Pepperoni	р

#### Drinks:

Small	S
Medium	т
Large	1

### THE PIZZA PLACE



Menu Item	Price
Pizza Slice:	
Cheese	\$1.00
Pepperoni	\$1.25
Drinks:	
Small	\$0.95
Medium	\$1.20
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	_

(Assume that tax is included)

Let  $c = \cos t$  of a cheese Let  $p = \cos t$  of pepperoni Let  $s = \cos t$  of small drink Let  $m = \cos t$  of medium drink Let  $L = \cos t$  of large drink

## the cost of Let's write down an order:

Let c = cost of a cheeseLet p = cost of pepperoniLet s = cost of small drinkLet m = cost of medium drinkLet L = cost of large drink 2 slices of cheese pizza and one small drink, please!

2c + s

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## Let's find the cost of the order:

#### Pizza Slice:

Cheese	\$1.00
Pepperoni	\$1.25

#### **Drinks:**

Small	\$0.95
Medium	\$1.20
Large	\$1.60

2 slices of cheese pizza and one small drink, please!

2c + s = 2(1.00) + (0.95)= 2.95

\$2.95



## Another order

#### **Pizza Slice:**

Cheese	\$1.00
Pepperoni	\$1.25

#### **Drinks:**

Small	\$0.95
Medium	\$1.20
Large	\$1.60

4c + 2s





## Another order

#### Pizza Slice:

Cheese	\$1.00
Pepperoni	\$1.25

#### **Drinks:**

Small	\$0.95
Medium	\$1.20
Large	\$1.60

(2c + s) + (2c + s)=2(2c+s)





#### Let's consider an equation

<b>PIZZA SHOP MENU</b> (The variable represents the cost of the item.)			
Pizza		Drinks	
Cheese slice (c)	\$1.00	Small drink ( <i>s</i> )	\$0.95
Pepperoni slice (p)	\$1.25	Medium drink ( <i>m</i> )	\$1.20
Daily Special (d)	\$1.75	Large drink ( <i>L</i> )	\$1.60
		Extra-large drink (x)	\$1.90

The cost of one slice of pepperoni pizza and another item is the same as the cost of 3 slices of cheese pizza.

$$p + \boxed{=} 3c$$
  
1.25 +  $\boxed{=} 3(1.00)$   
1.25 +  $\boxed{=} 3.00$ 

#### We find a value that makes the equation true.

<b>PIZZA SHOP MENU</b> (The variable represents the cost of the item.)			
Pizza		Drinks	
Cheese slice (c)	\$1.00	Small drink ( <i>s</i> )	\$0.95
Pepperoni slice (p)	\$1.25	Medium drink ( <i>m</i> )	\$1.20
Daily Special (d)	\$1.75	Large drink ( <i>L</i> )	\$1.60
		Extra-large drink (x)	\$1.90



#### We can solve more complicated equations:

	<b>PIZZA SHOP MENU</b> (The variable represents the cost of the item.)				
Pizza		Drinks			
Cheese slice (c)	\$1.00	Small drink (s)	\$0.95		
Pepperoni slice (p)	\$1.25	Medium drink (m)	\$1.20		
Daily Special (d)	\$1.75	Large drink (L)	\$1.60		
		Extra-large drink (x)	\$1.90		

$$5s + \square = 2 \bullet \square + 2d$$

The cost of five small drinks and an item is the same as the cost of two of the same item and cost of two daily specials.

$$5(.95) + \square = 2 \bullet \square + 2(1.75)$$
  
 $4.75 + \wp = 2\wp + 3.50$ 

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## Solution Strategies

Encourage students to share and discuss a variety of solution strategies. Some strategies may include:

- guess and check
- substitution
- using inverse operations
- performing operations to both sides of the equation

## In this session, we used a pizza restaurant menu to help students:

- Build meaning for variables, expressions, and equations
- Use sense-making strategies, such as substitution, to determine if a solution makes an equation true.



## Handout

#### VARIABLES, EXPRESSIONS, EQUATIONS AND INEQUALITIES

	(The wariable reasons)	IOP MENU	<b>N</b>
	(The variable represe	its the cost of an item.	)
Pizza Cheese slice (c) Pepperoni slice (p)	\$1.00 \$1.25	Drinks Small drink (s) Medium drink (m) Large drink (L)	\$0.95 \$1.20 \$1.60
Expressions			
1.	2.	3.	4.
Equations			
5. 4p = 5•		6. m + 2• = 4p	
Inequalities			
<ol> <li>If Sam has less than \$1.20, write all the variable inequalities from the menu that make sense. For example, one of them is c &lt; 1.20.</li> </ol>		<ol><li>Is this inequality true or false?</li></ol>	
		s + L > 1.50	
		<ol><li>Find an item from the menu to make this inequality true:</li></ol>	
		3 < m	+ 2p
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## **THANK YOU!**

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