At Algorithms Pizza they have the exponential pizza, which is a 24-inch cheese pizza that costs $17.50. Each topping for the pizza costs $2.35. If Connor ordered the exponential pizza and was charged $29.25, how many toppings were on his pizza? Justify your answer by using an algebraic equation to solve this problem step by step.

$17.50 + 2.35x = 29.25$
$-17.50 \qquad -17.50$
$\frac{2.35x}{2.35} = \frac{11.75}{2.35}$
$\boxed{x = 5}$

$17. pie
$3. for each Topping
Jeremy $40

$17 + 3x \le 40$
$-17 \qquad -17$
$\frac{3x}{3} \le \frac{23}{3}$
$x \le 7\frac{2}{3}$
$0 \le x \le 7$
0, 1, 2, 3, 4, 5, 6, 7

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Part A: Use the properties to justify the reason for each step in the chart below.

Statements	Reasons
a. $\frac{3(x+5)-5}{5} = 20$	a. Given
b. $5 \cdot \frac{3(x+5)-5}{5} = 20 \cdot 5$	b. Multiplicative Prop
c. $3(x+5)-5 = 100$	c. Simplified
d. $3x+15-5 = 100$	d. Distribute
e. $3x+10 = 100$	e. Equivalent Equation
f. $3x+10-10 = 100-10$	f. Subtract
g. $3x = 90$	g. ~~Equivalent Equation~~ Simplified
h. $\frac{3x}{3} = \frac{90}{3}$	h. Division
i. $x = 30$	i. Equivalent Equation

Part B: Suppose that the property used in step (d) is not used at all to solve this equation. What other alternatives do you have to solve this equation from step (c) until you get the answer?

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Other way

$\frac{3(x+5)-5}{5} = \frac{20}{1}$

$3(x+5)-5 = 100$
$+5 \quad +5$

$\frac{\cancel{3}(x+5)}{\cancel{3}} = \frac{105}{3}$

$x+5 = 35$
$-5 \quad -5$

$x = 30$

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Solve each equation.

1. $|x-2|-3=5$
$+3 \quad +3$
$|x-2| = 8$
$x-2=8$ and $x-2=-8$
$+2 \quad +2 \qquad +2 \quad +2$
$\boxed{x=10, \quad x=-6}$

2. $|x+7|+2=10$
$-2 \quad -2$
$|x+7| = 8$
$x+7=8$ & $x+7=-8$
$-7 \quad -7 \qquad -7 \quad -7$
$\boxed{x=1 \quad x=-15}$

3. $4|x-5|=20$
$\frac{4|x-5|}{4} = \frac{20}{4}$
$|x-5| = 5$
$x-5=5$ & $x-5=-5$
$+5 \quad +5 \qquad +5 \quad +5$
$\boxed{x=10 \quad x=0}$

4. $|2x|+1=7$
$-1 \quad -1$
$|2x| = 6$
$\frac{2x}{2} = \frac{6}{2}$ & $\frac{2x}{2} = \frac{-6}{2}$
$\boxed{x=3 \quad x=-3}$

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$\frac{3|x-4|+10}{2} = \frac{50}{1}$

$3|x-4|+10 = 100$
$-10 \quad -10$

$\frac{3|x-4|}{3} = \frac{90}{3}$

$|x-4| = 30$ If $|x-4| = -30$
Distance
N/S
$\varnothing$ solutions

$x-4=30$ and $x-4=-30$
$\boxed{x=34 \text{ and } x=-26}$

$|-26-4|$
$|x-4|$
$|34-4|$
30

$|-30| = 30$

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LESSON 1-7 **Practice B** Page 45
Solving Absolute-Value Equations

Solve each equation.

1. $|x| = 12$
$x=12$ & $x=-12$

2. $|x| = \frac{1}{2}$
$x = \frac{1}{2}, -\frac{1}{2}$

3. $|x|-6=4$
$+6 \quad +6$
$|x| = 10$
$\boxed{x=-10 \quad x=10}$

4. $5+|x|=14$
$-5 \quad -5$
$|x| = 9$
$\boxed{x=\pm 9}$

5. $3|x|=24$
$|x| = 8$
$x=\pm 8$

6. $\boxed{|x+3}=10$
$x+3=10$
$x+3=-10$
$-3 \quad -3$
$7, -13$

7. $|x-1|=2$
$x-1=2$ $x-1=-2$
$3, -1$

8. $\frac{4|x-5|}{4} = \frac{12}{4}$
$|x-5| = 3$
$x-5=3$ $\boxed{8}$
$x-5=-3$ $\boxed{2}$

9. $|x+2|-3=9$
$|x+2| = 12$
$x+2=12$ & $x+2=-12$
$10, -14$

10. $|6x| = 18$

11. $|x-1|=0$
$x-1=0$
$x=1$

12. $|x-3|+2=2$

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13. How many solutions does the equation $|x + 7| = 1$ have? Two

14. How many solutions does the equation $|x + 7| = 0$ have? One

15. How many solutions does the equation $|x + 7| = -1$ have? None

Leticia sets the thermostat in her apartment to 68 degrees. The actual temperature in her apartment can vary from this by as much as 3.5 degrees.

16. Write an absolute-value equation that you can use to find the minimum and maximum temperature. _____

17. Solve the equation to find the minimum and maximum temperature. _____

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$|x-7| = -3$ N/S

$|x| \neq$ Neg Number

Isolated N/S

$\frac{-3|x-7|}{-3} = \frac{-3}{-3}$

$|x-7| = 1$

Two Solutions

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Absolute Inequalities

$|x| >$ more is or

$|x| <$ less is and

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Examples

1) $|x| \geq 5$ $|x|$ more than 5

1) Isolate $|x|$

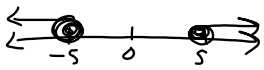
2) Remove Bars

3) Set to the orignal

4) Flip the sign and Take the negative

OR

$x \geq 5$ or $x \leq -5$



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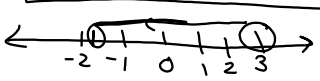
$|3x-2| < 7$

$3x-2 < 7$ and $3x-2 > -7$

$+2 \quad +2$ $\quad +2 \quad +2$

$\frac{3x}{3} < \frac{9}{3}$ $\quad \frac{3x}{3} > \frac{-5}{3}$

$\boxed{x < 3 \text{ and } x > -\frac{5}{3}}$



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$|8-3x| \geq 7$

$8-6$

$8-3x \geq 7$ or $8-3x \leq -7$

$-8 \quad -8$ $\quad -8 \quad -8$

$\frac{-3x}{-3} \geq \frac{-1}{-3}$ $\quad \frac{-3x}{-3} \leq \frac{-15}{-3}$

$x \leq \frac{1}{3}$ $\quad x \geq 5$

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Solve Multistep equations
Solve multistep inequalities
Compound inequalities — and/or
Absolute Value Equations
Absolute Value Inequalities — Compound and/or
Zero Product Property

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Zero Product Property

$(x-3)(2x+7)=0$

$x-3=0$
$+3\ +3$
$x=3$

$2x+7=0$
$-7\ -7$
$\frac{2x}{2}=\frac{-7}{2}$
$x=\frac{-7}{2}$

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