

Warm-Up

1. Factor $x^2 + 10x + 24$

$$a=1 \quad b=10 \quad c=24$$

$$\cancel{10} \quad \cancel{4} \quad (x+6)(x+4)$$

2. Identify the domain and range: $-|x + 3| + 2$

$$D: (-\infty, \infty) \quad R: (-\infty, 2]$$

$$f(x) = 3x + 2 \quad g(x) = x^2 \quad h(x) = x + 1$$

4. evaluate: $f(3)$ $g(2)$ $f(g(5))$ $g(f(1))$

$$11 \quad 4 \quad 77 \quad 25$$

5. evaluate: $f(g(h(3)))$

$$50$$

$h(f(g(3)))$

$$30$$

ACT Question of the Day

7. The first term is 1 in the geometric sequence 1, -3, 9, -27, ... What is the SEVENTH term of the geometric sequence?

- A. -243 1, -3, 9, -27, 81, -243, 729
B. -30
C. 81
D. 189
E. 729

Black History Fact of the Day:

Harriet Tubman became famous as a "conductor" on the Underground Railroad during the turbulent 1850s. Born a slave on Maryland's eastern shore, she endured the harsh existence of a field hand, including brutal beatings. In 1849 she fled slavery, leaving her husband and family behind in order to escape. Despite a bounty on her head, she returned to the South at least 19 times to lead her family and hundreds of other slaves to freedom via the Underground Railroad. Tubman also served as a scout, spy and nurse during the Civil War.

Harriet Tubman's birthname was Araminta Ross. Two things sustained her: the pistol at her side and her faith in God. She would not hesitate to use the pistol in self-defense, but it was also a symbol to instruct slaves, making it clear that "dead Negroes tell no tales." Timid slaves seemed to find courage in her presence; no one ever betrayed her. She affirmed her faith in God in her statement, "I always tole God, I'm gwine to hole stiddy on to you, an' you've got to see me trou [through]."

Review: Player Coach

1. Factor: $x^2 + 10x + 21$
 $(x+7)(x+3)$

$$\begin{array}{r} \cancel{21} \\ 7 \times 3 \\ \hline 10 \end{array}$$

2. Convert to inequality notation: $D: [5, \infty)$ $R: [0, \infty)$
 $D: 5 \leq x < \infty$ $R: 0 \leq y < \infty$

3. Identify the domain and range: $f(x) = -|x + 3| + 2$

$$f(x) = x + 2 \quad g(x) = 3x \quad h(x) = x^2$$

4. Evaluate: $h(f(x))$

5. Evaluate: $g(f(x))$

$$f(x) = \begin{cases} 2x & , \quad x < 3 \\ x+1 & , \quad 3 \leq x < 7 \\ 3 & , \quad x \geq 7 \end{cases}$$

6. $f(3) = 4$
 $3 + 1 = 4$

7. $f(10)$
 3

8. $f(-5)$
 $2(-5) = -10$

9. $2f(4) + f(-10)$
 $2(5) + 2(-10)$

$$10 + \begin{matrix} -20 \\ -10 \end{matrix}$$

Unit 1 Functions:

Solving Absolute Value Equations

The absolute value of a number 'a' is written as $|a|$ and it is the distance between 'a' and zero on a number line.

Example 1:

$$|x + 5| = 7$$

$$\begin{array}{l} |x+5|=7 \\ -5 \quad -5 \\ \hline x = 2 \checkmark \end{array} \quad \begin{array}{l} |x+5|=-7 \\ -5 \quad -5 \\ \hline x = -12 \checkmark \end{array}$$

$$\begin{array}{l} |2+5|=7 \\ |7|=7 \\ 7=7 \checkmark \end{array} \quad \begin{array}{l} |-12+5|=7 \\ |-7|=7 \\ |-7|=7 \\ 7=7 \checkmark \end{array}$$

$$|x - 3| = 15$$

$$\begin{array}{l} |x-3|=15 \\ +3 \quad +3 \\ \hline x = 18 \checkmark \end{array} \quad \begin{array}{l} |x-3|=-15 \\ +3 \quad +3 \\ \hline x = -12 \checkmark \end{array}$$

Example 2:

$$|2x + 4| - 8 = 40$$

$$\begin{array}{l} |2x+4|=48, |2x+4|=-48 \\ -4 \quad -4 \quad -4 \quad -4 \\ \hline \frac{2x}{2} = \frac{44}{2} \quad \frac{2x}{2} = \frac{-52}{2} \end{array}$$

$$x = 22$$

$$x = -26$$

$$|3x - 6| + 12 = 36$$

$$\begin{array}{l} |3x-6|=24, |3x-6|=-24 \\ +6 \quad +6 \quad +6 \quad +6 \\ \hline 3x = 30 \quad 3x = -18 \\ x = 10 \quad x = -6 \end{array}$$

Example 3:

$$\frac{4|x+5|}{4} = \frac{40}{4}$$

$$|x+5|=10 \quad |x+5|=-10$$
$$x=5 \quad x=-15$$

$$\frac{7|2x-10|}{7} = \frac{63}{7}$$

$$\frac{|2x-10|=9 \quad |2x-10|=-9}{+10 \quad +10 \quad +10 \quad +10}$$
$$\frac{2x=19}{2} \quad \frac{2x=1}{2}$$
$$x=19/2 \quad x=1/2$$

Classwork