ANSWERS
Downingtown High School
East/West
Keystone Algebra 1 Review
Module 1
Linear Inequalities
1. Solve the following inequality.

\[
\begin{align*}
24 &< -2(x - 3) < 36 \\
-16 &< x < -9
\end{align*}
\]

\[
\begin{align*}
\frac{2x - 2}{b} &< 3b & \frac{18}{-2} &< \frac{-2x}{-2} &< \frac{36}{-2} \\
-9 &> x &> -15
\end{align*}
\]

A. \(-16 < x < -9\)  
B. \(-21 < x < -15\)  
C. \(-15 < x < -9\)  
D. \(-21 < x < -15\)

2. Solve the following inequality.

\[
\begin{align*}
|3x + 4| &< 8 \\
3x + 4 &< 8 \\
&-4 \quad -4 \\
\frac{3x}{3} &< \frac{4}{3} \\
&x \leq \frac{4}{3}
\end{align*}
\]

A. \(x < \frac{4}{3}\)  
B. \(-\frac{4}{3} < x < \frac{4}{3}\)  
C. \(-8 < x < \frac{4}{3}\)  
D. \(3x + 4 > -8\)

3. Which of the following graphs shows the solution set for the inequality below?

\[
|2x + 4| > 2
\]

A.  
B.  
C.  
D.  

4. Tom can spend up to $40 for gasoline and a carwash at a service station. The carwash will cost $6.00, and a gasoline costs $4.50 per gallon. The inequality below can be solved for \(g\), the number of gallons of gasoline Tom can buy.

\[
4.5g + 6 \leq 40
\]

Which of the following is a true statement?

A. Tom can buy over 10 gallons of gasoline.  
B. Tom can buy at most 7 gallons of gasoline  
C. Tom can buy 6 gallons, but not 7 gallons.  
D. Tom can buy 7 gallons of gasoline, but not 8 gallons.
5. Which of the following graphs shows the solution to the inequality \(-\frac{1}{2}x - 4 < 0\)?

A.  

B.  

C.  

D.  

\[ -\frac{1}{2}x - 4 < 0 \]

\[ \frac{-1}{2}x < 4 \]

\[ x > -8 \]

6. Which graph represents the following system of inequalities?

\[
\begin{align*}
\{ y &> \frac{1}{3}x-2 \} \text{ dotted line, } m = \frac{1}{3}, \text{ start at } (0, -2) \\
\{ y &\leq -2x-1 \} \text{ solid line, } m = -2, \text{ start at } (0, -1) 
\end{align*}
\]
7. Choose the system of inequalities that best matches the graph below.

A. \( y < 2x + 2 \)  
\[ y < x \]
B. \( y \leq x - 2 \)  
\[ y > -x \]
C. \( y < 2x \)  
\[ y \leq x \]
D. \( y < 2x + 2 \)
\[ y > -x \]

8. At an ice-cream parlor, ice-cream cones cost \( x \) dollars each and sundaes cost \( y \) dollars each. The total cost of 4 cones and 3 sundaes is more than \$20. The total cost of 5 cones and 1 sundae is less than \$16. This situation can be represented by which of the following system of inequalities:

A. \( 4x + 3y > 20 \)
\[ 5x + y < 16 \]
B. \( 4x + 3y < 20 \)
\[ 5x + y > 16 \]
C. \( 4x + 3y > 20 \)
\[ 5x + y \leq 16 \]
D. \( 4x + 3y < 20 \)
\[ 5x + y \leq 16 \]

9. Choose the system of inequalities that best matches the graph below.

A. \( y < -1 \)  
\[ x \leq 1 \]
B. \( y \leq -1 \)  
\[ x < 1 \]
C. \( y < 1 \)  
\[ x \leq -1 \]
D. \( y > -1 \)  
\[ x \geq 1 \]

\( x = ? \) = vertical line
\[ \text{vertical line} \]
\( y = ? \) = horizontal line
\[ \text{horizontal line} \]