ANSWERS

Downingtown High School

East/West

Keystone Algebra 1 Review

Module 1

Linear Inequalities

$$(a + b)^2 = a^2 + 2ab + b^2$$
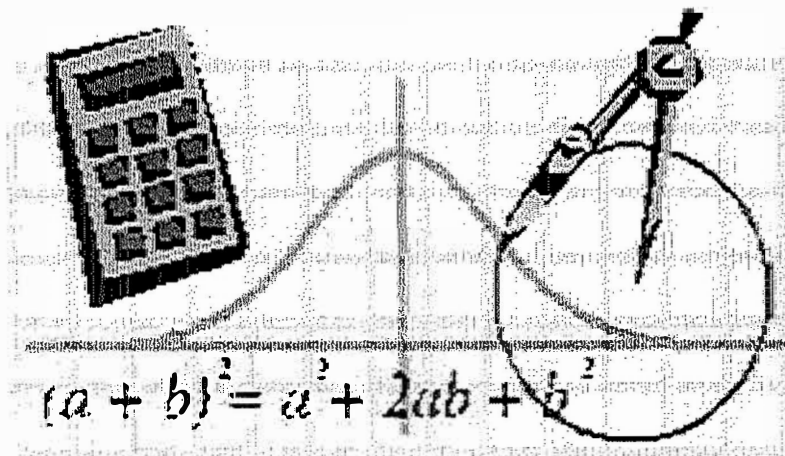
1. Solve the following inequality.

$24 < -2(x - 3) < 36$

$24 < -2x + 6 < 36$
$-6 \quad -6 \quad -6$

A. $-16 < x < -15$

$\dfrac{18}{-2} < \dfrac{-2x}{-2} < \dfrac{30}{-2}$

B. $-21 < x < -9$

$-9 > x > -15$

C. $-21 < x < -15$

$x > -15$

D. $-15 < x < -9$ *(circled)*

$x < -9$

2. Solve the following inequality.

$|3x + 4| < 8$

$3x + 4 < 8$
$\quad -4 \quad -4$
$3x < 4$
$\dfrac{3x}{3} \quad \dfrac{4}{3}$
$\boxed{x < 4/3}$
and

A. $x < \dfrac{4}{3}$

B. $-\dfrac{4}{3} < x < 4$

C. $-4 < x < \dfrac{4}{3}$ *(circled)*

$3x + 4 > -8$
$\quad -4 \quad -4$
$\dfrac{3x}{3} > \dfrac{-12}{3}$
$\boxed{x > -4}$

D. $-8 < x < \dfrac{4}{3}$
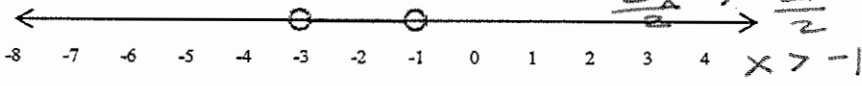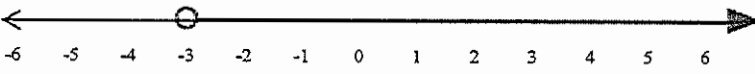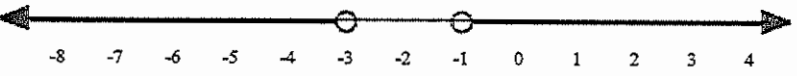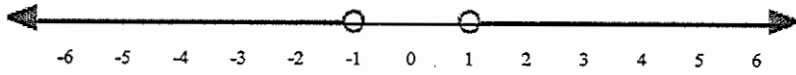
3. Which of the following graphs shows the solution set for the inequality below?

$|2x \div 4| > 2$

$2x + 4 > 2$ or $2x + 4 < -2$
$\quad -4 \;\; -4 \qquad\qquad -4 \;\; -4$
$\dfrac{2x}{2} > \dfrac{-2}{2} \qquad \dfrac{2x}{2} < \dfrac{-6}{2}$
$x > -1 \qquad\qquad x < -3$

A. *(number line from -8 to 4, open circles at -3 and -2)*

B. *(number line from -6 to 6, open circle at -3, arrow right)*

C. *(circled)* *(number line from -8 to 4, open circles at -3 and -1, arrows both directions)*

D. *(number line from -6 to 6, open circles at -1 and 0)*

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.
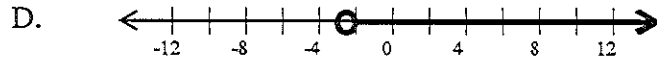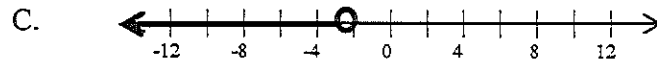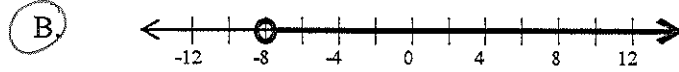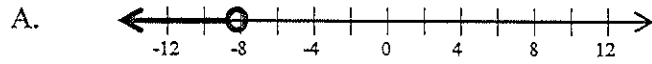
$4.5g + 6 \leq 40$

$4.5g + 6 \leq 40$
$\quad -6 \quad -6$
$\dfrac{4.5g}{4.5} \leq \dfrac{34}{4.5}$
$g \leq 7.5$

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. *(circled)*

5. Which of the following graphs shows the solution to the inequality $-\dfrac{1}{2}x - 4 < 0$?

A.

```
←——○——————————————————→
  -12  -8   -4   0   4   8   12
```

(B)

```
←———○━━━━━━━━━━━━━━━━━→
  -12  -8   -4   0   4   8   12
```

C.

```
◄━━━━━━━━━━○——————————→
  -12  -8   -4   0   4   8   12
```

D.

```
◄━━━━━━━━○————————————→
  -12  -8   -4   0   4   8   12
```

Handwritten work:

$-\dfrac{1}{2}x - 4 < 0$

$+4 \quad +4$

_____
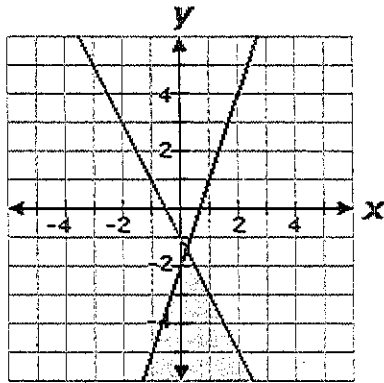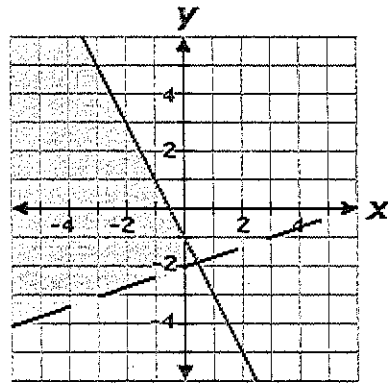
$2 \cdot -\dfrac{1}{2}x < 4 \cdot 2$

$x > -8$

6. Which graph represents the following system of inequalities?

$$\begin{cases} y > \dfrac{1}{3}x - 2 \\ y \le -2x - 1 \end{cases}$$
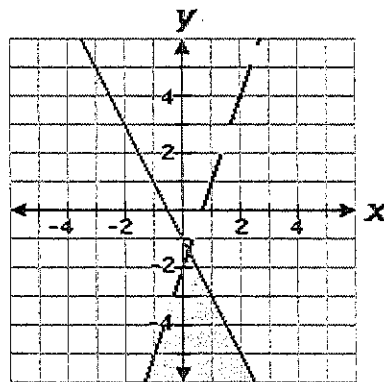
Handwritten: ← dotted line, $m = \dfrac{1}{3}$, start at $(0, -2)$
← solid line, $m = \dfrac{-2}{1}$, start at $(0, -1)$

W.

X.

Y.
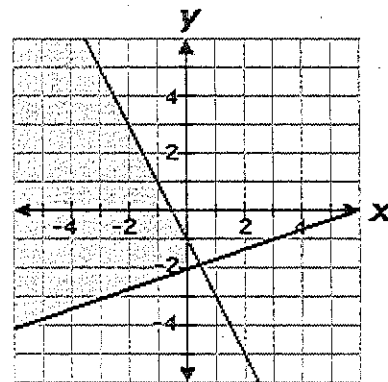
Z.

A. Y

(B. X)

C. W

D. Z

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

both dashed so
>, or <
(eliminate B. & C.)

intersects y-axis at (0,0)
slope is −1 so ↙
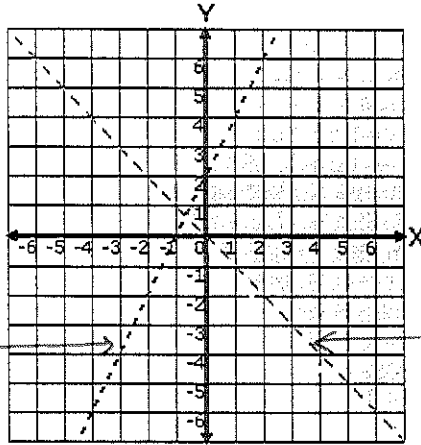
line starts at 2
on y-axis,
rises 2, run 1, so 2x+2

A. $y < 2x + 2$	B. $y \leq x - 2$	C. $y < 2x$	D. $y < 2x + 2$
$y < x$	$y > -x$	$y \leq x$	$y > -x$

(D is circled)

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:
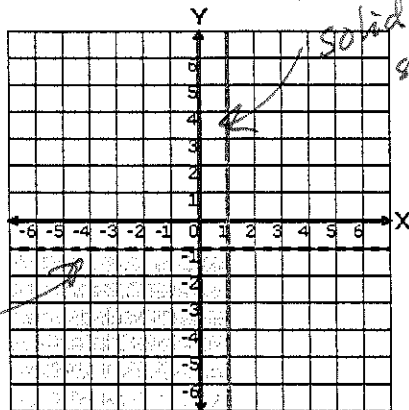
more than = >
less than = <

A. $4x + 3y > 20$	B. $4x + 3y < 20$	C. $4x + 3y \geq 20$	D. $4x + 3y \leq 20$
$5x + y < 16$	$5x + y > 16$	$5x + y \leq 16$	$5x + y \leq 16$

(A is circled)

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

solid x at 1
shading
to left
(<)

dashed
y
at −1
shading
below (<)

A. $y < -1$
$x \leq 1$

(A is circled)

B. $y \leq -1$
$x < 1$

C. $y < 1$
$x \leq -1$

D. $y > -1$
$x \geq 1$

x = ? = vertical line
y = ? = horizontal line