

Name _____

Class _____

(1-13, 15, 18) Date _____

Alg.2 Practice 2-5

Absolute Value Functions and Graphs

Match each equation with its graph.

$x-1=0$
 $+1 +1$
 $x=1$

1. $y=|x-1|$

(1,0) e

2. $y=2|x-1|$

C

3. $y=|2x-1|$

A

4. $y=|x-1|$

(0,-1) F

5. $y=|2x-1|$

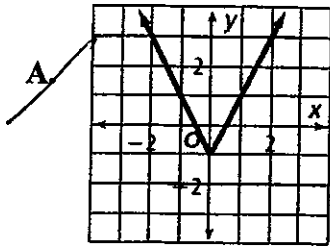
B

6. $y=|2x-2|$

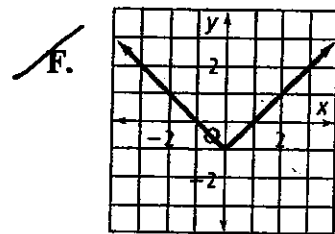
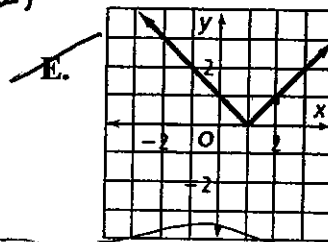
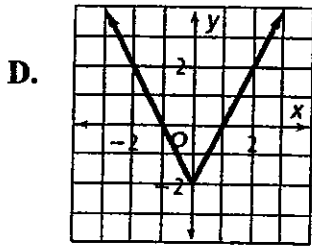
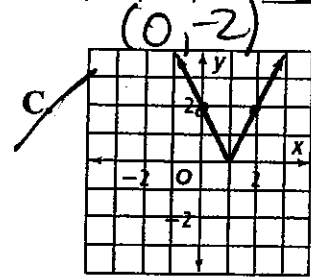
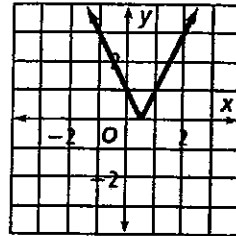
d

(1,0) slope 2

$2x=0$
 $x=0$
(0,-1)



$2x-1=0$
 $+1 +1$
 $2x=1$
 $x=\frac{1}{2}$
 $(\frac{1}{2}, 0)$



Graph each equation by writing two linear equations.

7. $y=|x-3|$

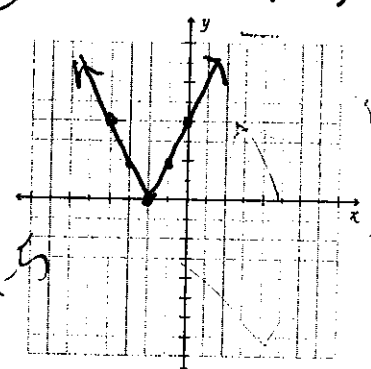
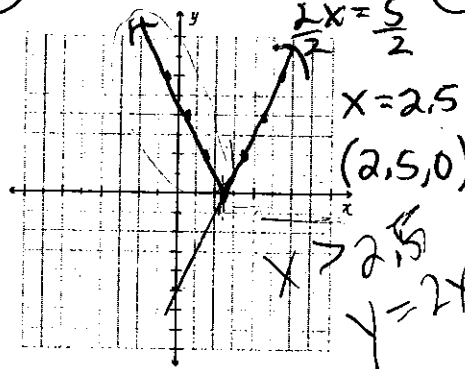
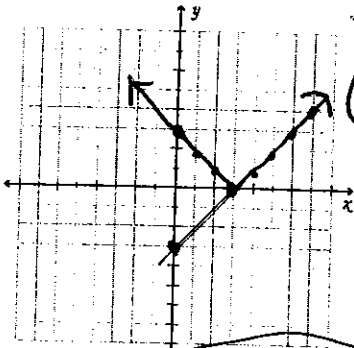
$x-3=0$
 $+3 +3$
 $x=3$

8. $y=|2x-5|$

$2x-5=0$
 $+5 +5$
 $2x=5$
 $x=2.5$

9. $y=2|x+2|$

slope
 $x+2=0$
 $+2 +2$
 $x=-2$
 (-2, 0)



10. $y=|x+3|-1$

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

(-3, -1)

11. $y=-|3x+4|$

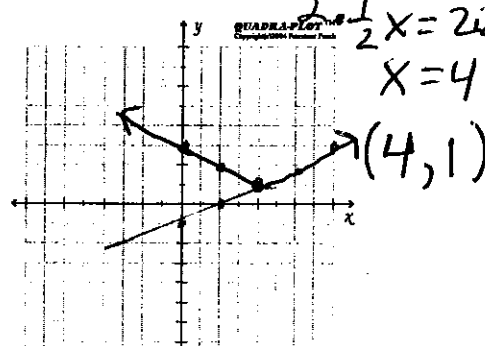
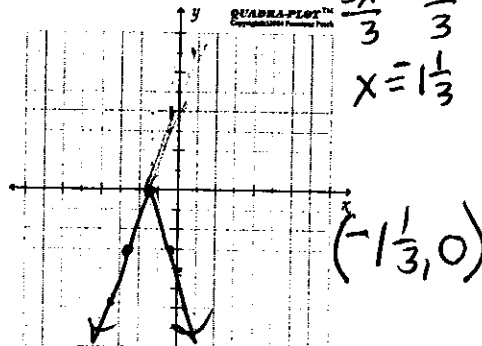
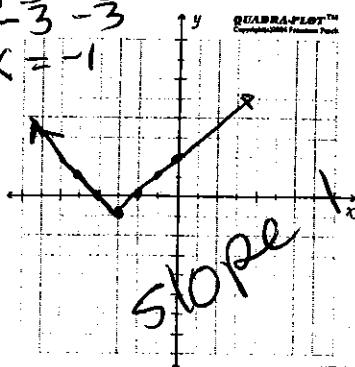
$3x+4=0$
 $-4 -4$
 $3x=-4$
 $x=-\frac{4}{3}$

(-1 1/3, 0)

12. $y=|\frac{1}{2}x-2|+1$

$\frac{1}{2}x-2=0$
 $+2 +2$
 $\frac{1}{2}x=2$
 $x=4$

(4, 1)



slope 1

reflection slope 3

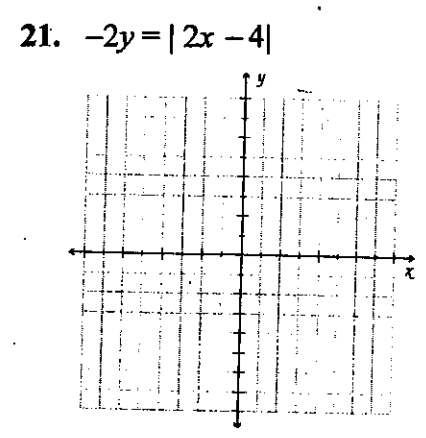
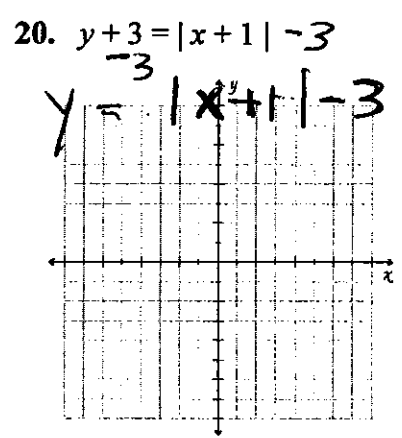
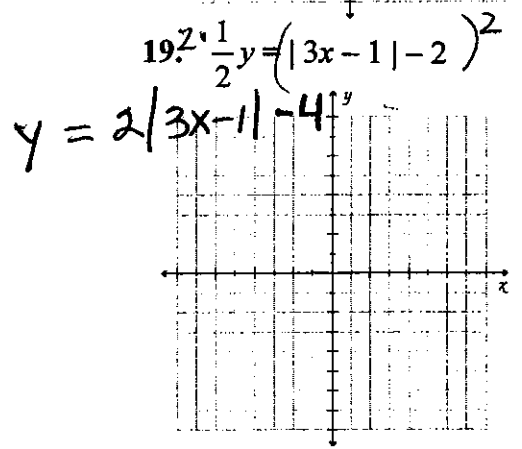
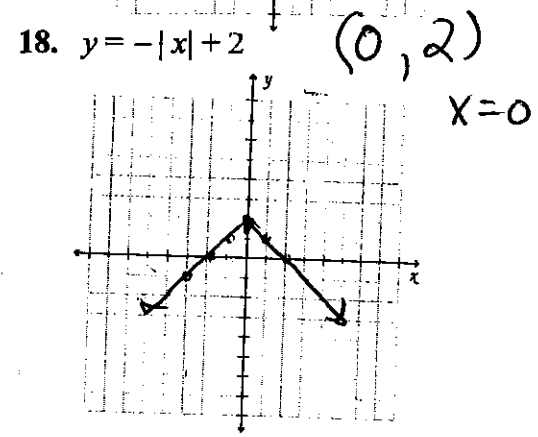
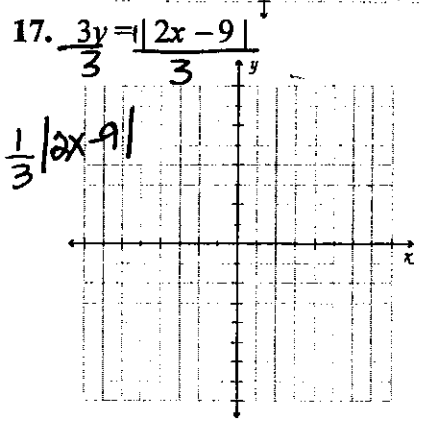
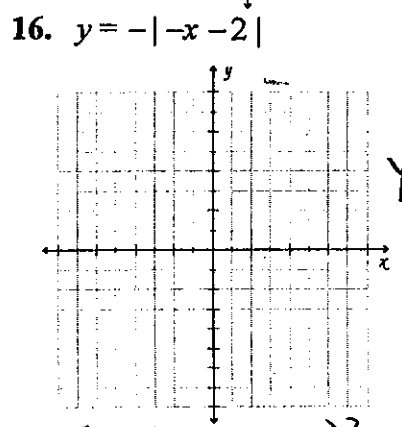
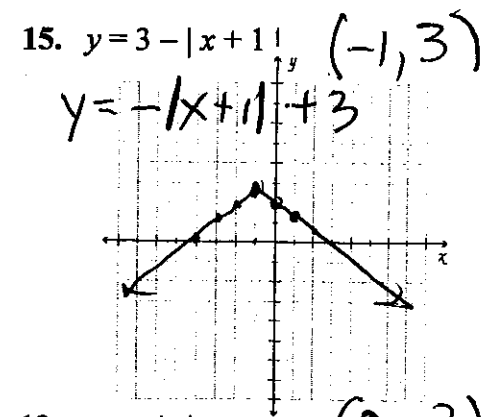
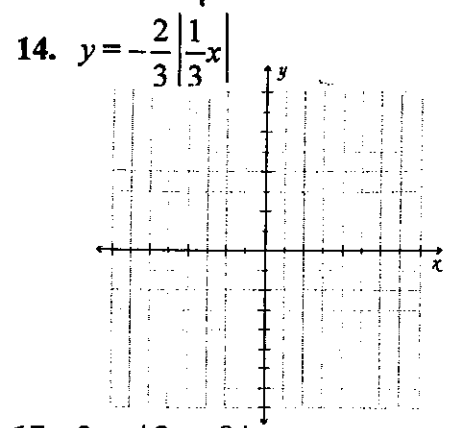
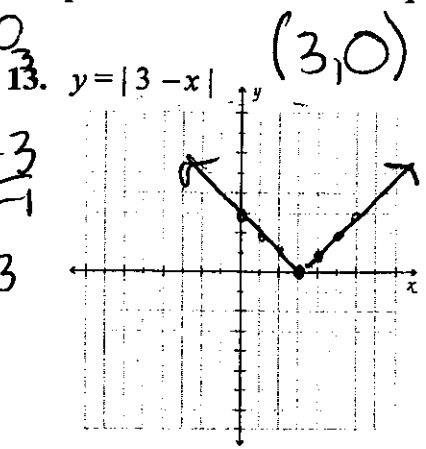
slope 1/2

Graph each absolute value equation.

slope $\frac{2}{3}, \frac{1}{3}$ (circled) $\frac{2}{9}$
open down

$x+1=0$
 $-1 \quad -1$
 $x=-1$

$\frac{3}{3} - x = 0$
 $-x = -3$
 $x = 3$



Alg.2 Practice 2-6

Families of Functions

Shifts left, right, up, down, reflection

Describe each translation of $f(x) = |x|$ as vertical, horizontal, or combined.

1. $f(x) = |x + 2|$

2. $f(x) = |x + 4|$

3. $f(x) = |x| - 5$

4. $f(x) = |x + 1| - 1$

5. $f(x) = |x - 2| + 1$

6. $f(x) = \left| x - \frac{3}{2} \right|$

right $\frac{1}{2}$

$x - \frac{3}{2} = 0$ (circled) $x = \frac{3}{2}$
 $+ \frac{3}{2}$ (circled) $x = 1\frac{1}{2}$

outside abs. value bars \uparrow up + down / Inside the abs. value bars \downarrow " - "

Write an equation for each translation.

7. $y = |x|$, 1 unit up, 2 units left " + "

$$y = |x + 2| + 1$$

8. $y = |x|$, 4 units right " - "

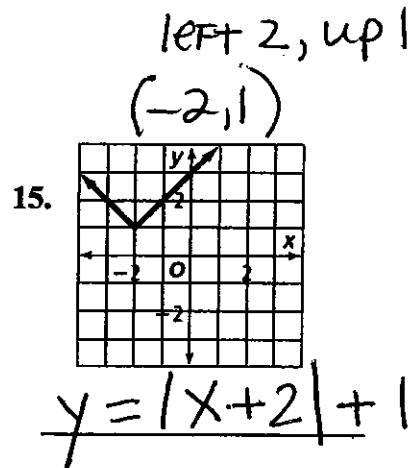
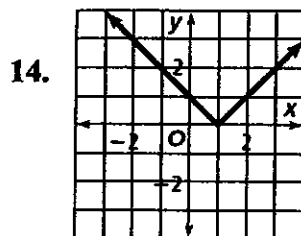
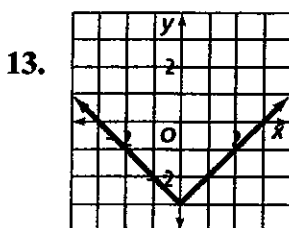
9. $y = -|x|$, 3 units up, 1 unit right

10. $y = -|x|$, $\frac{3}{2}$ units down, $\frac{1}{2}$ unit right

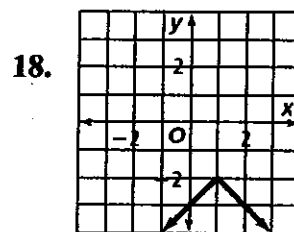
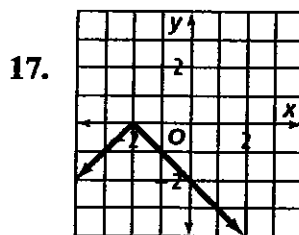
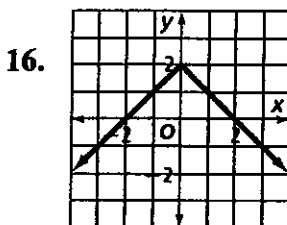
11. $y = |x|$, 2 units down, 3 units left

12. $y = -|x|$, $\frac{3}{5}$ unit up

Write the equation of each translation of $y = |x|$.

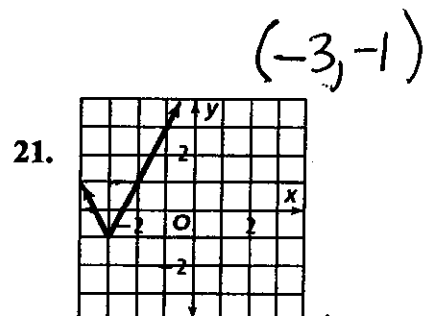
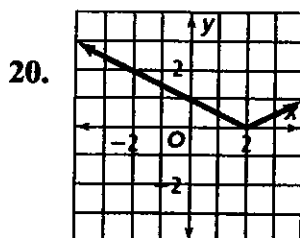
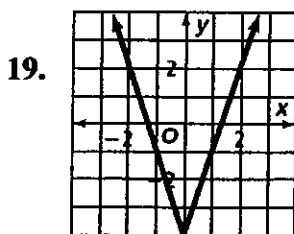


Write the equation of each translation of $y = -|x|$. (-2, 0)



left 2
$$y = -|x + 2|$$

Write the equation for each graph.



$$y = 2|x + 3| - 1$$

slope $\frac{2}{1}$ left 3 down 1

Writing 2 linear equations for an absolute value equation.

⑦

$$\begin{array}{l} x \geq 3 \\ x < 3 \end{array} \quad \begin{array}{l} y = |x - 3| \\ y = -|x - 3| \end{array}$$

domain

x-value
of the
vertex

⑧

$$\begin{array}{l} x \geq 4 \\ x < 4 \end{array} \quad \begin{array}{l} y = \frac{1}{2}x - 1 \\ y = -\frac{1}{2}x + 3 \end{array}$$

⑨

$$\begin{array}{l} x \geq -1\frac{1}{3} \\ x < -1\frac{1}{3} \end{array} \quad \begin{array}{l} y = -3x - 4 \\ y = 3x + 4 \end{array}$$