

Algebra 2 Test 1.3 Review Key

I. Linear Regression.

1. Given the data, find...

Median Income (thousands \$) x	70	46	57	65	55	60
Median Home Price (thousands \$) y	130	95	116	106	99	116

- (a) the correlation coefficient
 (b) an equation for the line of best fit
 (c) a prediction for the median home price of a median income of \$50,000

(a) $r \approx 0.799$

(b) $y \approx 1.24x + 37.51$

(c) $x = 50 \iff \$50,000$

$$y \approx 1.24(50) + 37.51$$

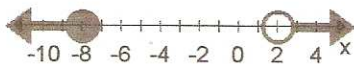
$$y \approx 99.51$$

$$\approx \$99,510$$

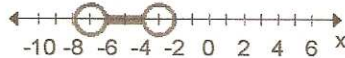
OR if use exact equation of linear regression, then $y \approx 99.399$ so $\approx \$99,399$.

II. Write a compound inequality for each graph.

2.



3.



4.



(2) $x \leq -8 \text{ OR } x \geq 2$

(3) $x > -7 \text{ and } x < -3$
 $-7 < x < -3$

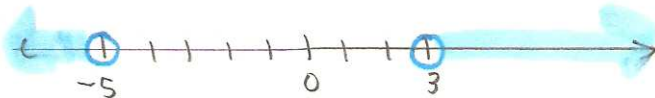
(4) $x \geq -1 \text{ and } x \leq 5$
 $-1 \leq x \leq 5$

$$\textcircled{5} \quad 3x + 6 > 15 \quad \text{OR} \quad 5x + 13 < -12$$

$$\frac{3x}{3} > \frac{9}{3}$$

$$\frac{5x}{5} < \frac{-25}{5}$$

$$x > 3 \quad \text{OR} \quad x < -5$$



$$\textcircled{6} \quad 2(3x + 6) \leq 42 \quad \text{AND} \quad 5x + 15 \geq 2x + 9$$

$$6x + 12 \leq 42$$

$$-2x \quad -2x$$

$$3x + 15 \geq 9$$

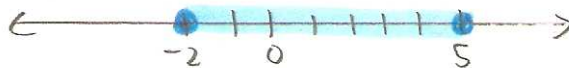
$$\frac{6x}{6} \leq \frac{30}{6}$$

$$\frac{3x}{3} \geq \frac{-6}{3}$$

$$x \leq 5 \quad \text{AND}$$

$$x \geq -2$$

$$-2 \leq x \leq 5$$



$$\textcircled{7} \quad -4x + 2 > -10 \quad \text{AND} \quad 5x - 12 < 8$$

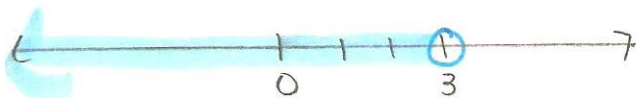
$$\frac{-4x}{-4} > \frac{-12}{-4}$$

$$\frac{5x}{5} < \frac{20}{5}$$

$$x < 3 \quad \text{AND}$$

$$x < 4$$

$$x < 3$$



$$\textcircled{8} \quad 3x - 4 \geq 8 \quad \text{OR} \quad -x + 12 > 16$$

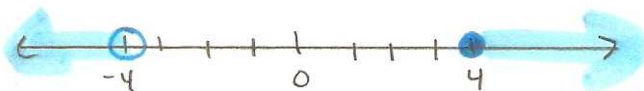
$$\frac{3x}{3} \geq \frac{12}{3}$$

$$x \geq 4$$

$$\frac{-x}{-1} > \frac{4}{-1}$$

$$x < -4$$

$$\boxed{x < -4 \text{ OR } x \geq 4}$$



$$\textcircled{9} \quad |2x| = 4$$

$$\frac{2x}{2} = \frac{4}{2} \quad \text{OR}$$

$$x = 2$$

$$\frac{2x}{2} = \frac{-4}{2}$$

$$x = -2$$

$$\boxed{x = 2 \text{ OR } x = -2}$$

$$\textcircled{10} \quad \frac{-3|x|}{-3} = \frac{18}{-3}$$

$$|x| = -6$$

a #'s distance from 0 can't be negative

$$\boxed{\emptyset}$$

$$\textcircled{11} \quad 4 \left(\frac{|x-6|}{4} \right) = (5)4$$

$$|x-6| = 20$$

$$x-6 = 20 \quad \text{OR}$$

$$x-6 = -20$$

$$\boxed{x = 26 \quad \text{OR} \quad x = -14}$$

$$\textcircled{12} \quad |2x-1| - 4 = 11$$

$$|2x-1| = 15$$

$$2x-1 = 15 \quad \text{OR}$$

$$2x-1 = -15$$

$$\frac{2x}{2} = \frac{16}{2}$$

$$\frac{2x}{2} = \frac{-14}{2}$$

$$\boxed{x = 8 \quad \text{OR} \quad x = -7}$$

Less th "AND"

$$(13) \quad |3x| \leq 15$$

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

$$x \leq 5 \quad \text{AND} \quad x \geq -5$$

$$\boxed{-5 \leq x \leq 5}$$

Less th "AND"

$$(14) \quad |x-6| < 4$$

$$x-6 < 4 \quad \text{AND} \quad x-6 > -4$$

$$+6 \quad +6 \qquad +6 \quad +6$$

$$x < 10 \quad \text{AND} \quad x > 2$$

$$\boxed{2 < x < 10}$$

Great "OR"

$$(15) \quad |5x+10| \geq 30$$

$$5x+10 \geq 30 \quad \text{OR} \quad 5x+10 \leq -30$$

$$-10 \quad -10 \qquad -10 \quad -10$$

$$\frac{5x}{5} \geq \frac{20}{5} \qquad \frac{5x}{5} \leq \frac{-40}{5}$$

$$x \geq 4 \quad \text{OR} \quad x \leq -8$$

$$\boxed{x \leq -8 \quad \text{OR} \quad x \geq 4}$$

Great "OR"

$$(16) \quad |2x-4| + 1 \geq 11$$

$$-1 \quad -1$$

$$|2x-4| \geq 10$$

$$2x-4 \geq 10 \quad \text{OR} \quad 2x-4 \leq -10$$

$$+4 \quad +4 \qquad +4 \quad +4$$

$$\frac{2x}{2} \geq \frac{14}{2} \qquad \frac{2x}{2} \leq \frac{-6}{2}$$

$$x \geq 7 \quad \text{OR} \quad x \leq -3$$

$$\boxed{x \leq -3 \quad \text{OR} \quad x \geq 7}$$

$$(17) \quad 4x + 5y = 2$$

$$4(3) + 5(2) = 2$$

$$12 + 10 = 2$$

$$22 = 2 \quad \times$$

$$\boxed{\text{NO}}$$

$$(18) \quad y = 3x - 4$$

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

$$2x + 3(3x - 4) = -1$$

$$2x + 9x - 12 = -1$$

$$11x - 12 = -1$$

$$+12 \quad +12$$

$$\frac{11x}{11} = \frac{11}{11}$$

$$x = 1$$

$$y = 3(1) - 4$$

$$y = 3 - 4$$

$$y = -1$$

$$\boxed{(1, -1)}$$

$$\textcircled{19} \quad \begin{aligned} x - 3y &= -10 \\ 3(2x + y) &= 1 \end{aligned}$$

$$\begin{aligned} x - 3y &= -10 \\ + 6x + 3y &= 3 \\ \hline \end{aligned}$$

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

$$x = -1$$

$$\begin{aligned} -1 - 3y &= -10 \\ +1 & \quad +1 \end{aligned}$$

$$\frac{-3y}{-3} = \frac{-9}{-3}$$

$$y = 3$$

$$\boxed{(-1, 3)}$$

$$\textcircled{20} \quad \begin{aligned} 4x - 9y &= 26 \\ -1(4x - 5y) &= 2 \end{aligned}$$

$$\begin{aligned} 4x - 9y &= 26 \\ + -4x + 5y &= -2 \\ \hline \end{aligned}$$

$$\frac{-4y}{-4} = \frac{24}{-4}$$

$$y = -6$$

$$4x - 9(-6) = 26$$

$$\begin{aligned} 4x + 54 &= 26 \\ -54 & \quad -54 \end{aligned}$$

$$\frac{4x}{4} = \frac{-28}{4}$$

$$x = -7$$

$$\boxed{(-7, -6)}$$

$$\textcircled{21} \quad \begin{aligned} y + x &= 5 \\ -x & \quad -x \end{aligned}$$

$$y = -x + 5$$

$$\begin{aligned} 3x - 5y &= -1 \\ -3x & \quad -3x \end{aligned}$$

$$\frac{-5y}{-5} = \frac{-3x - 1}{-5}$$

$$y = \frac{3}{5}x + \frac{1}{5}$$

$$\boxed{(3, 2)}$$