

Show all work. Circle or box your final answer.

Solve for the indicated variable.

1. The formula $a = \frac{v_f - v_i}{t}$ is used to find an object's acceleration given initial velocity v_i , final velocity v_f , and time t . Solve this formula for v_f .

$$ta = v_f + v_i \quad [ta + v_i = v_f]$$

2. Solve $3x - 7y = z$ for x

$$\begin{array}{r} 3x - 7y = z \\ +7y \quad \quad \quad +7y \\ \hline 3x = z + 7y \\ \hline x = \frac{z + 7y}{3} \end{array} \quad [x = \frac{z + 7y}{3}]$$

3. The formula $I = Prt$ can be used to determine the interest I that is earned on a principal amount of money P , when the money is invested at an annual percentage rate r for t years.

- a. Solve the formula $I = Prt$ for t .

$$t = \frac{I}{Pr}$$

- b. If a couple invests \$5000 in an account that earns a 3% interest rate, how long will they need to invest it to earn \$1200 in interest? (Hint: Convert the interest rate to a decimal.)

$$[8] \quad 1200 = 5000(0.03)t \quad \text{or} \quad \frac{1200}{(5000)(0.03)} = t$$

Solve each equation.

4. $4(2x - 3) = 3 + 8x - 11$

$$\begin{array}{r} 8x - 12 = -8 + 8x \\ -8x \quad \quad \quad -8x \\ \hline -12 = -8x \end{array} \quad [NS]$$

5. $-y - 8 + 6y = -9 + 5y + 1$

$$\begin{array}{r} 5y - 8 = 5y - 8 \\ -5y \quad \quad \quad 5y \\ \hline -8 = -8 \checkmark \end{array} \quad [R \text{ or } IS]$$

6. $9 + 2.7t = -4.8t - 6$

$$\begin{array}{r} 9 + 2.7t = -4.8t - 6 \\ -9 + 4.8t + 4.8t - 9 \\ \hline 7.5t = -15 \\ [t = -2] \end{array}$$

7. $2\left(n + \frac{1}{3}\right) = \frac{3}{2}n + 1 + \frac{1}{2}n - \frac{1}{3}$

$$2n + \frac{2}{3} = \frac{4}{2}n + \frac{2}{3} \rightarrow 2n + \frac{2}{3} = 2n + \frac{2}{3} \quad [R \text{ or } IS]$$

8. The table below shows the costs of ordering T-shirts from two different companies. With how many T-shirts would the cost of the order be the same with both companies? What would that cost be?

Company	Price Per Shirt	Shipping
Crazy Shirts	\$8.00	\$13.00
T's for All	\$7.50	\$16.00

$$8x + 13 = 7.50x + 16$$

$$.50x = 3$$

$$[x = 6]$$

Solve each inequality.

9. $5(n-2) < 4(2n+6) + 2$

$$5n - 10 < 8n + 24 + 2$$

$$5n - 10 < 8n + 26$$

$$-3n < 36$$

$$[n > -12]$$

11. $2a + 10 \leq 2(-2a + 3) + 6a$

$$2a + 10 \leq -4a + 6 + 6a$$

$$2a + 10 \leq 2a + 6$$

$$10 \leq 6 \times [NS]$$

10. $\frac{2}{3}y + 6 < \frac{2}{3}y - 6$

$$6 < -6 \times [NS]$$

12. $0.42d < 152.5 + 0.17d$

$$0.25d < 152.5$$

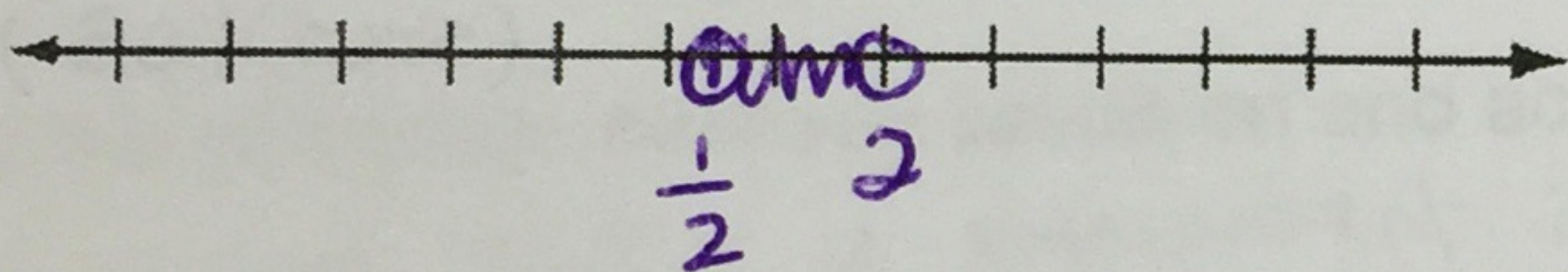
$$[d < 610]$$

Solve each compound inequality and graph the solutions.

13. $-1 < 4x - 3 < 5$

$$\begin{array}{ccc} +3 & +3 & +3 \\ \hline \end{array}$$

$$\frac{2}{4} < \frac{4x}{4} < \frac{8}{4} \rightarrow \frac{1}{2} < x < 2$$



14. $3a - 5 \leq -2$ OR $3a - 5 \geq 13$

$$\begin{array}{ccc} +5 & +5 & \\ \hline \end{array}$$

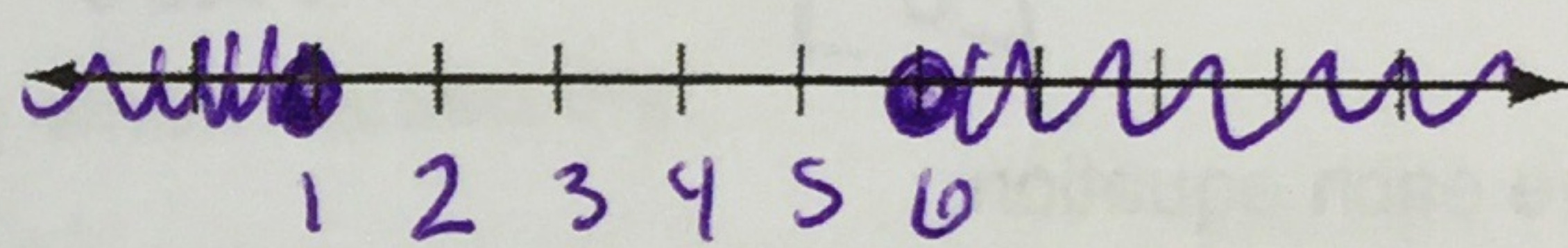
$$3a \leq 3$$

$$a \leq 1$$

$$\begin{array}{ccc} +5 & +5 & \\ \hline \end{array}$$

$$3a \geq 18$$

$$a \geq 6$$



15. $-y - 2 < 6$ OR $4y + 8 \leq 20$

$$\begin{array}{ccc} +2 & +2 & \\ \hline \end{array}$$

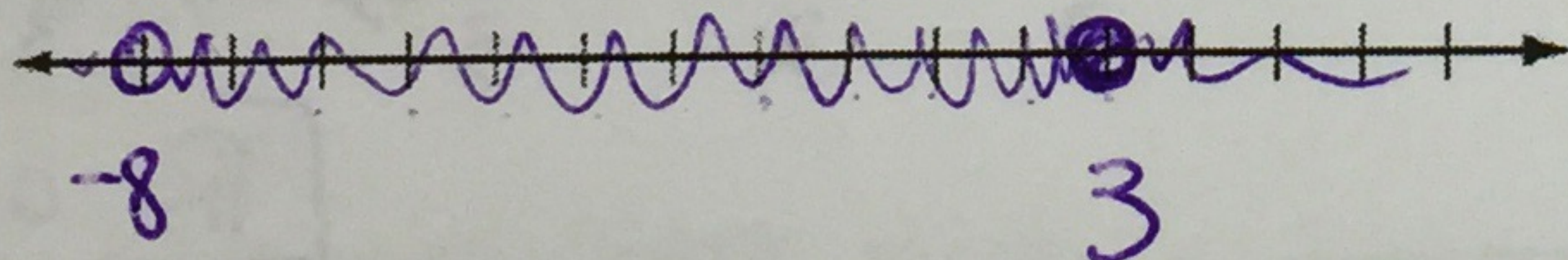
$$-y < 8$$

$$y > -8$$

$$\begin{array}{ccc} -8 & -8 & \\ \hline \end{array}$$

$$4y \leq 12$$

$$y \leq 3$$



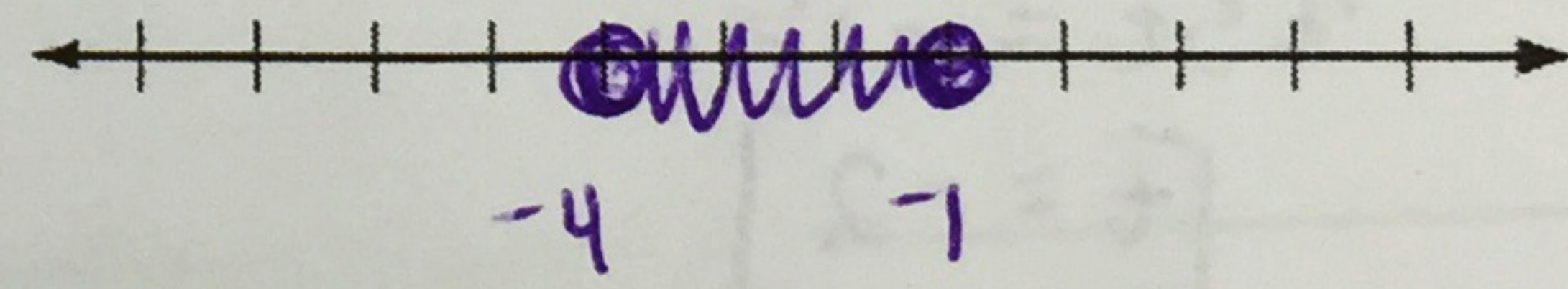
16. $3 \leq -2x + 1 \leq 9$

$$\begin{array}{ccc} -1 & -1 & -1 \\ \hline \end{array}$$

$$\frac{2}{-2} \leq \frac{-2x}{-2} \leq \frac{8}{-2}$$

$$-1 \geq x \geq -4$$

$$\text{or } -4 \leq x \leq -1$$



17. The United States Postal Service charges a "nonmachinable surcharge" for first-class mail if the length of the envelope (parallel to the address) divided by the height of the envelope is less than 1.3 or more than 2.5. Charlene has an envelope with a height of 3.5 inches. Write a compound inequality to show the lengths in inches for which Charlene will have to pay the surcharge.

$$\frac{L}{h} < 1.3 \quad \text{or} \quad \frac{L}{h} > 2.5$$

$$\frac{L}{3.5} < 1.3$$

$$L < 4.55$$

$$\frac{L}{3.5} > 2.5$$

$$L > 8.75$$

