

1. Find the solution of the equation

$$3(x+3) = 12$$

$$\begin{array}{r} 3x + 9 = 12 \\ -9 \quad -9 \\ \hline 3x = 3 \\ \frac{3}{3} \quad \frac{3}{3} \end{array}$$

$$\boxed{x = 1}$$

2. Find the solution of the equation  $\frac{x}{4} + 7 = 5$ 

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

$$\boxed{x = -8}$$

3. Find the solution of the equation

$$4(2x+1) = 27 + 3(2x-5)?$$

$$\begin{array}{r} 8x + 4 = 27 + 6x - 15 \\ 8x + 4 = 12 + 6x \\ -6x \quad -6x \\ \hline 2x + 4 = 12 \\ -4 \quad -4 \\ \hline 2x = 8 \\ \frac{2}{2} \quad \frac{8}{2} \end{array}$$

$$\boxed{x = 4}$$

4. Find the solution of the equation

$$\frac{12}{x} = \frac{3}{8}$$

$$\frac{3x}{3} = \frac{96}{3}$$

$$\boxed{x = 32}$$

5. Find the solution of the equation

$$2(x-3) = 1.2 - x$$

$$\begin{array}{r} 2x - 6 = 1.2 - x \\ +x \quad +x \\ \hline 3x - 6 = 1.2 \\ +6 \quad +6 \\ \hline 3x = 7.2 \\ \frac{3}{3} \quad \frac{7.2}{3} \end{array}$$

$$\boxed{x = 2.4}$$

6. Which value of  $p$  is the solution of

$$5p - 1 = 2p + 20?$$

$$\begin{array}{r} -2p \quad -2p \\ \hline 3p - 1 = 20 \\ +1 \quad +1 \\ \hline 3p = 21 \\ \frac{3}{3} \quad \frac{21}{3} \end{array}$$

$$\boxed{p = 7}$$

7. Solve for  $n$ :  $\frac{3}{2}n - 4 = 5$ 

$$\begin{array}{r} \frac{3}{2}n - 4 = 5 \\ +4 \quad +4 \\ \hline \frac{3}{2}n = 9 \cdot 2 \\ \frac{3n}{3} = \frac{18}{3} \end{array}$$

$$\boxed{n = 6}$$

8. Find the solution of the equation  $5x - (x+2) = 10$ 

$$5x - x - 2 = 10$$

$$4x - 2 = 10$$

$$\begin{array}{r} 4x - 2 = 10 \\ +2 \quad +2 \\ \hline 4x = 12 \\ \frac{4}{4} \quad \frac{12}{4} \end{array}$$

$$\boxed{x = 3}$$

9. Which operation would you apply first to solve

$$\frac{1}{2}(x+3) = -11?$$

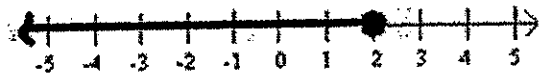
1. addition
2. multiplication
3. subtraction
4. division

10. Find all negative odd integers that satisfy the following inequality:  $-3x+1 \leq 17$

$$\begin{array}{r} -1 \quad -1 \\ -3x \leq 16 \\ \hline * \text{flip} \quad -3 \quad -3 \\ x \geq -5.\bar{3} \end{array}$$

$$* \{-5, -3, -1\}$$

11. Here is the graphical representation of a set of real numbers:



a. Describe this set of real numbers in words.

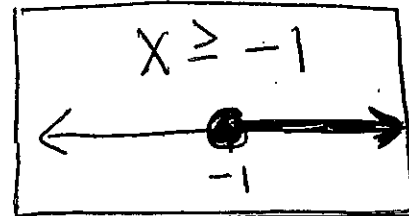
$x$  is less than or equal to 2.

b. Describe this set of real numbers in set notation.

$$\{x \leq 2\}$$

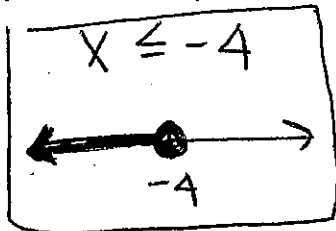
12. Solve and graph the inequality:

$$\begin{array}{r} 2x - 3 = -5 \\ +3 \quad +3 \\ \hline 2x \geq -2 \\ \hline x \geq -1 \end{array}$$



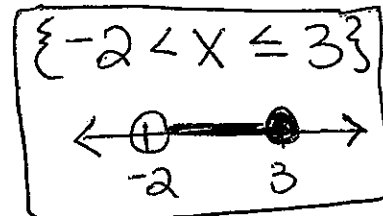
13. Solve and graph the inequality.

$$* \text{flip} \quad \frac{x \geq 4}{-1 \quad -1}$$



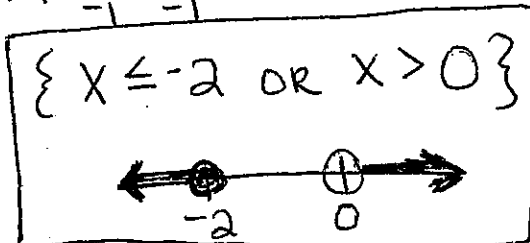
14. Solve and graph the inequality. Express the solution set as a compound inequality.

$$\begin{array}{r} -3 < x - 1 \leq 2 \\ +1 \quad +1 \quad +1 \end{array}$$



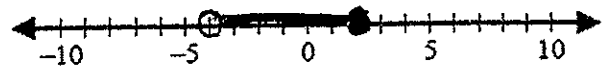
15. Solve and graph the inequality. Express the solution set as a compound inequality.

$$* \text{flip} \quad \frac{-x \geq 2}{-1 \quad -1} \text{ or } (x > 0)$$



16. Solve and graph:  $x+5 \leq 7$  and  $-6x < 24$

$$\begin{array}{r} -5 \quad -5 \\ x \leq 2 \\ \hline \end{array} \quad \begin{array}{r} -6 \quad -6 \\ -6x < 24 \\ \hline x > -4 \end{array}$$



$$\{-4 < x \leq 2\}$$

17. The solution set of which inequality is shown in the graph below?



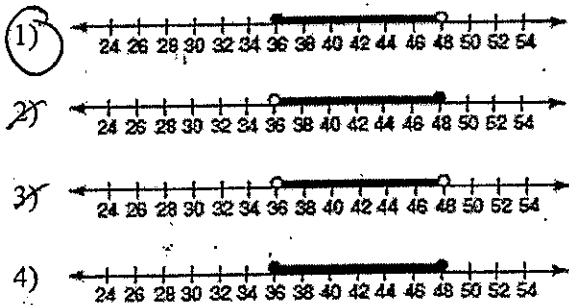
- 1)  $x - 2 \geq 0$   
 $+2 +2$   $x \geq 2$
- 2)  $x - 2 > 0$
- 3)  $x - 2 < 0$
- 4)  $x - 2 \leq 0$

18. The graph below shows the solution set of which inequality?

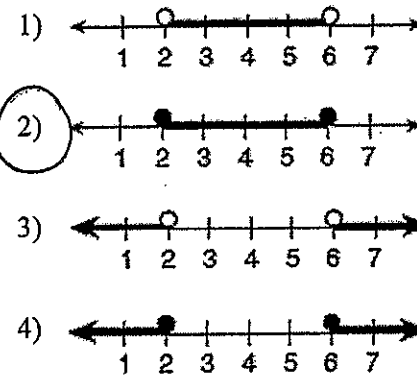


- 1)  $-4 < x < 1$
- 2)  $-4 \leq x < 1$
- 3)  $-4 < x \leq 1$
- 4)  $-4 \leq x \leq 1$

19. In order to be admitted for a certain ride at an amusement park, a child must be greater than or equal to 36 inches tall and less than 48 inches tall. Which graph represents these conditions?



20. Which graph represents the solution set for  $2x - 4 \leq 8$  and  $x + 5 \geq 7$ ?

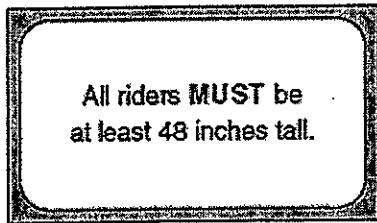


$$\begin{aligned} 2x - 4 &\leq 8 \\ +4 +4 & \\ \hline 2x &\leq 12 \\ \frac{2x}{2} &\leq \frac{12}{2} \\ x &\leq 6 \end{aligned}$$

$$\begin{aligned} x + 5 &\geq 7 \\ -5 -5 & \\ \hline x &\geq 2 \end{aligned}$$

$$\{2 \leq x \leq 6\}$$

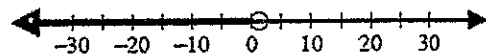
21. The sign shown below is posted in front of a roller coaster ride at the Wadsworth County Fairgrounds. If  $h$  represents the height of a rider in inches, what is a correct translation of the statement on this sign?



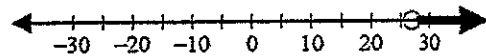
- 1)  $h < 48$
- 2)  $h > 48$
- 3)  $h \leq 48$
- 4)  $h \geq 48$

22. Solve for the inequality and graph the solution on the number line

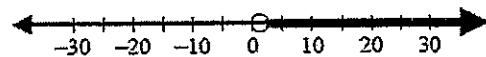
[A]  $x < 1.3$



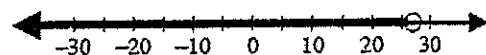
[B]  $x > 27$



[C]  $x > 1.3$



[D]  $x < 27$



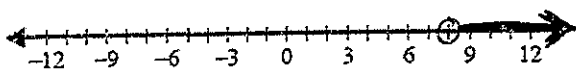
23. Solve and graph the following inequality:

$$5 \cdot \frac{2x+4}{5} > 4 \cdot 5$$

$$2x+4 > 20$$

$$\begin{aligned} -4 -4 & \\ \hline 2x &> 16 \\ \frac{2x}{2} &\frac{16}{2} \end{aligned}$$

$$x > 8$$



24. The formula for converting temperature in degrees Fahrenheit is  $F = \frac{9}{5}C + 32$ . If the temperature is  $20^\circ$  C, what is the temperature in degrees Fahrenheit?

$$F = \frac{9}{5}C + 32$$

If the temperature is  $20^\circ$  C, what is the temperature in degrees Fahrenheit?

$$F = \frac{9}{5}(20) + 32$$

$$F = 36 + 32$$

$$F = 68^\circ$$

25.

$$k(y+f) = h$$

$$\frac{k(y+f)}{k} = \frac{h}{k} \quad \text{OR} \quad \frac{ky + kf}{-kf \quad -kf} = \frac{h}{k}$$

$$y+f = \frac{h}{k}$$

$$y = \frac{h}{k} - f$$

$$\frac{ky}{k} = \frac{h - kf}{k}$$

$$y = \frac{h - kf}{k}$$

26. If  $c = 2m + d$ , then  $m$  is equal to

$$\frac{-d \quad -d}{2} = \frac{c-d}{2}$$

$$m = \frac{c-d}{2}$$

27. If  $x = 2a - b^2$ , what is the value of  $a$ ?

$$+b^2 \quad +b^2$$

$$2a = \frac{x + b^2}{2}$$

$$a = \frac{x + b^2}{2}$$

28. What is the value of  $x$  if  $2ax + 7x = 6a + 21$ 

\* rewrite using distributive property!

$$\frac{x(2a+7)}{2a+7} = \frac{6a+21}{2a+7}$$

$$x = \frac{6a+21}{2a+7}$$

29. Which of the following is equivalent to the equation

$$\frac{4r + 7s = q}{-7s \quad -7s}$$

a.  $r = 4q - 28s$

b.  $r = \frac{q-7s}{4}$

c.  $s = 7q + 28r$

d.  $s = \frac{q+4r}{7}$

$$\frac{4r}{4} = \frac{q-7s}{4}$$

$$r = \frac{q-7s}{4}$$

30. An example of an algebraic expression is

1)  $x+2 \rightarrow$  does not have an equal sign

2)  $y = x + 2$

3)  $y < x + 2$

4)  $y = x^2 + 2x$

31.

Compare the quantities in Column A and Column B.

Column A  
the value of  $x$  for which

the denominator of  $y = \frac{x}{x-8}$

is zero  $x \neq 8$ Column B  
the value of  $x$  for which

the denominator of  $y = \frac{x}{8-x}$

is zero  $x \neq 8$ 

[A] The quantity in Column A is greater.

[B] The quantity in Column B is greater.

[C] The quantities are equal.

[D] The relationship cannot be determined from the information given.

32. Which value of  $x$  makes the expression  $\frac{x+4}{x-3}$ 

undefined?

$$x-3=0$$

$$+3 \quad +3$$

$$x = 3$$

33. If the length of one side of a square is represented as  $n-4$ , determine its area.

1)  $n-16$

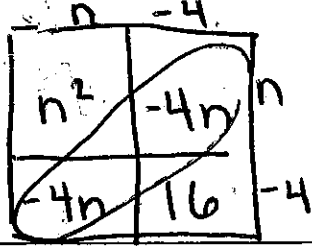
2)  $4n-16$

3)  $n^2 - 8n + 16$

4)  $n^4 - 16$

$n^2 - 8n + 16$

$A = S^2$   
 $A = (n-4)^2$   
 $A = (n-4)(n-4)$



34. When  $3a^2 - 2a + 5$  is subtracted from  $a^2 + a - 1$ , the result is

(1)  $2a^2 - 3a + 6$

(2)  $-2a^2 + 3a - 6$

(3)  $2a^2 - 3a - 6$

(4)  $-2a^2 + 3a + 6$

$(a^2 + a - 1) - (3a^2 - 2a + 5)$   
 $a^2 + a - 1 - 3a^2 + 2a - 5$   
 $-2a^2 + 3a - 6$

35. Express both the perimeter and the area of the rectangle shown in the accompanying diagram as polynomials in simplest form.

$P = x - 4$

$x - 4$

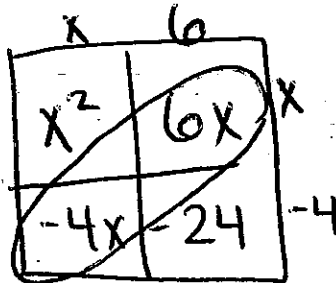
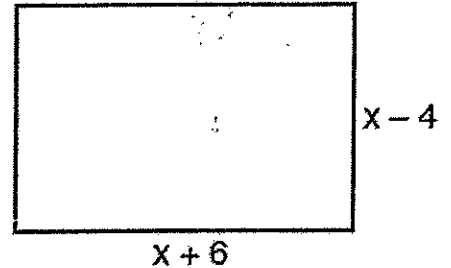
$x + 6$

$+ x + 6$

$P = 4x + 4$

$A = L \cdot W$

$= (x+6)(x-4)$



$A = x^2 + 2x - 24$