2.7 (29) adult $6.00
child $4.00 6 more
total revenue $184

① let x = The numbers of adult's
$x+6$ = the # of children's

	#	cost	total revenue
adults	x	6	$6(x)$
children	$x+6$	4	$4(x+6)$
total			184

② $6x + 4(x+6) = 184$

$6x + 4x + 24 = 184$

$10x + 24 = 184$

$-24 \quad -24$

$\frac{10x}{10} = \frac{160}{10}$

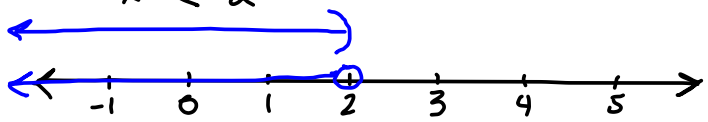
③ $x = 16$

$x + 6 = 22$

④ He sold 16 adult tickets and 22 children's tickets.

2.8 (11) $\frac{3x}{3} < \frac{6}{3}$

$x < 2$



interval notation

$(-\infty, 2)$

Between one and four

$1 < x < 4$

$\{x \mid 1 < x < 4\}$

the set of all x such that

$(1, 4)$ open

$[1, 4]$ $1 \leq x \leq 4$ closed

$x < 4$ lowest to highest $(4, \infty)$ without bound

2.8 cont

Solve: $3(m-2)-4 \geq 7m+14$

$3m-6-4 \geq 7m+14$

$3m-10 \geq 7m+14$

$+10 \qquad +10$

$3m \geq 7m+24$

$-7m \quad -7m$

$-4m \geq 24$

$\frac{-4m}{-4} \geq \frac{24}{-4}$

$m \leq -6$

$(-\infty, -6]$

$m = 0$

$m \geq -6$

$3(-2)-4 \geq +14$

$-6-4 \geq 14$

$-10 \geq 14$ false

NOT

Let $m = -7$

$3(-7-2)-4 \geq 7(-7)+14$

$3(-9)-4 \geq -49+14$

$-27-4 \geq -35$

$-31 \geq -35$ TRUE

Be careful!

$(-2)5 > 2(-2)$

$-10 > -4$ false

$-10 < -4$

Solving word problems using inequalities

"at least" → $x \geq$

"at most" → $x \leq$

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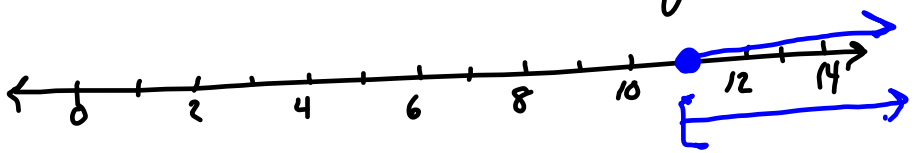
let n = the number

$$2(n-3) \geq n+5$$

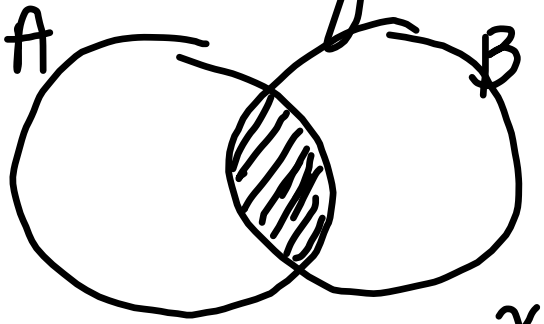
$$2n-6 \geq n+5$$

$$\begin{array}{r} -n \quad -n \\ \hline n-6 \geq 5 \\ +6 \quad +6 \\ \hline n \geq 11 \end{array}$$

The solutions are any number greater than or equal to 11



2.9 Compound Inequalities



$A \cap B$

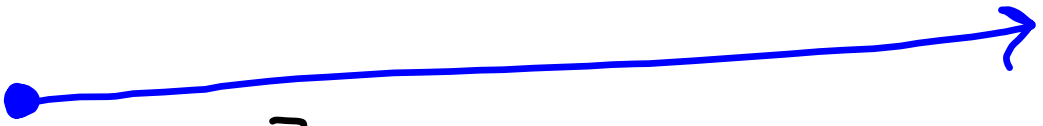
$x \in A$ and $x \in B$

① $x \leq 7$ and $x \geq 1$

$x \leq 7$

$x \leq 7$ and $x \leq 1$

$x \geq 1$



$[1, 7]$

(4) Solve $2x - 1 \geq 3$ and $-x > 2$

$+1 \quad +1$

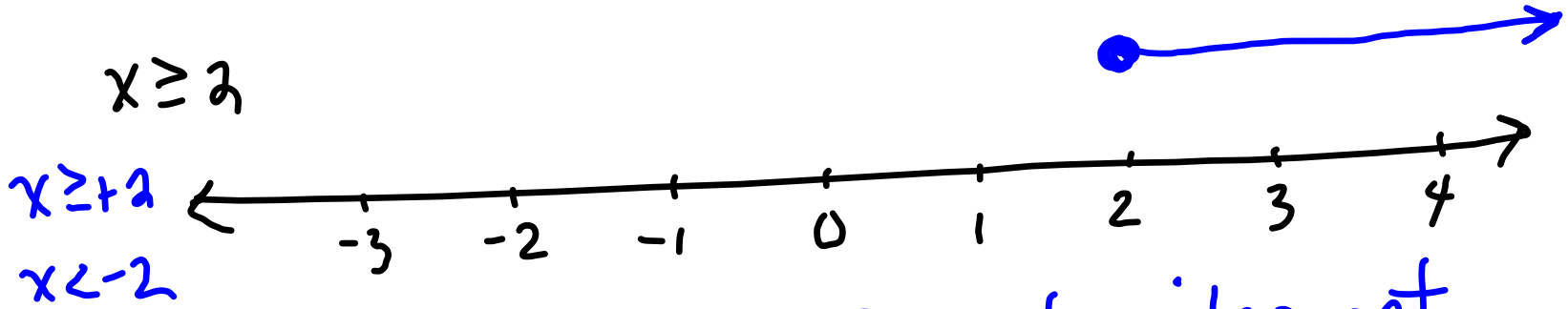
$2x \geq 4$

$\frac{2x}{2} \geq \frac{4}{2}$

$x \geq 2$

$\frac{-x}{-1} > \frac{2}{-1}$

$x < -2$



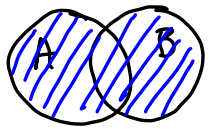
$x < -2$ ←

Do not intersect

{ } ∅

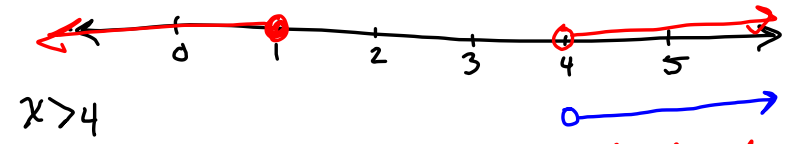
empty set

② $x \leq 1$ or $x > 4$



A ∪ B

$x \leq 1$



$x > 4$

everything in both sets

$(-\infty, 1] \cup (4, \infty)$

---

intersection: $x < 1$ and $x \geq -6$

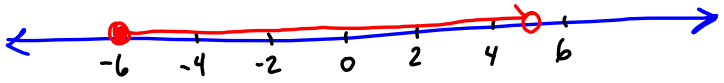
$-6 \leq x < 1$

can write an intersects as a single compound inequality

→ $-8 \leq x - 2 < 3$

$+2 \quad +2 \quad +2$

$-6 \leq x < 5$



(4) Solve:

$$\begin{array}{ccccc} 3 & < & 5x+1 & < & 11 \\ -1 & & -1 & & -1 \\ \hline \frac{2}{5} & < & \frac{5x}{5} & < & \frac{10}{5} \end{array}$$

$$\frac{2}{5} < x < 2$$

must face the same direction