≤

less than or equal to

no(t) more than

maximum

≤60

at most

≥

greater than or equal to

no(t) less than

minimum

at least

open dot

>

<

closed dot

≥

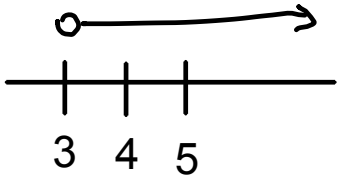
≤

1. a) $y \leq 25$ b) $x > y$ c) $a > 4$ d) $a + 2 \leq 13$

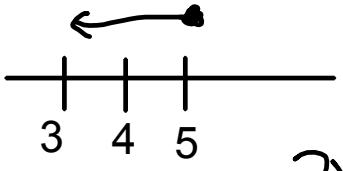
e) $2d - 5 \geq e$ f) $s \leq 100$ $S \geq 100$

2. A2 B1 C5 ~~D3~~ E5 C4 100 101 102

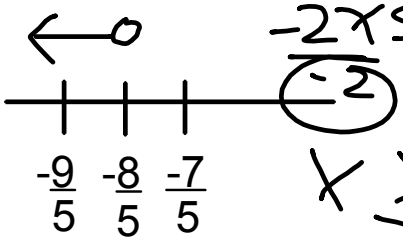
3.a)



b)



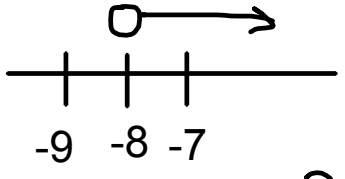
c)



$x < -\frac{8}{5}$

$]-\infty, -\frac{8}{5}[$

d)



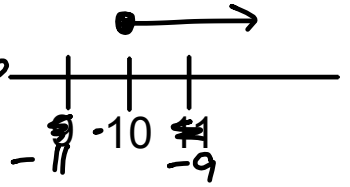
e) $-2x + 6 \leq 26$

$-2x \leq 26 - 6$

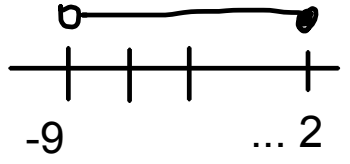
$-2x \leq 20$

$\frac{-2x}{-2} \geq \frac{20}{-2}$

$x \geq -10$



f)



4. a) $a < c - b + d$

b) $b < a - c + d$

c) $a > -\frac{c}{b}$

a) $a + b - d \geq c$

$a \geq c - b + d$

$-ab < c$, then

$a \_\_\_\_ -\frac{c}{b}$

$\frac{+ab}{+b} < \frac{c}{-b}$

$a > \frac{c}{b}$

Solving Inequalities

$\left(\frac{2}{3}\right)\left(-\frac{3}{2}\right)x < 5$

Golden rule: inequalities are flipped when...

multiplying/dividing by a negative number

e.g. $3 - 2x < 5$

$-2x < 5 - 3$

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

$x > -1$

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

e.g. $3(2 - x) + 1 > 2x - 3$

$6 - 3x + 1 > 2x - 3$

$6 - 3x > 2x - 3 - 1$

$-3x > 2x - 3 - 1 - 6$

$-3x - 2x > -3 - 1 - 6$

$\frac{-5x}{-5} > \frac{-10}{-5}$

$x < 2$

$\rightarrow 7 - 3x > 2x - 3$

$7 + 3 > 2x + 3x$

$7 + 3 - 3x > 2x$

$10 - 3x > 2x$

$10 > 2x + 3x$

$\frac{10}{5} > \frac{5x}{5}$

$2 > x$

Inequalities in Word Problems

There is a zombie outbreak in Canada, but so far only two cities have been severely infected. Toronto has twice as many zombies as Montreal, but combined they have at least 600 000 zombies. This means that there are at least how many zombies in Montreal?

Mtl Tor

$x + 2x \geq 600\,000$

$3x \geq 600\,000$

$x \geq 200\,000$