

Solutions

1. a) Write an inequality for the whole number solution set shown on the number line.



- b) Does the number line show the whole number solution set for $5x < 30$? Explain.

a) $x < 7$ (x is less than 7)

b) $\frac{5x}{5} < \frac{30}{5}$
 $x < 6$

No, it doesn't. We need to include 6 and the inequality doesn't include it.

2. Copy and complete the sentence for $m \geq 80\%$. Explain your choice of words.

You must score on an exam to be considered an honours student.

at least
 m needs to be greater than OR equal to 80%

4. Explain the difference between the solution sets for $a > 18$ and $a \geq 18$.

$a > 18$
↑
"a" is greater than 18.

$a \geq 18$
↑
"a" is greater than or equal to 18.

5. Write an inequality that models each situation. Define your variables.
- More than 50 students were surveyed.
 - The newspaper reported fewer than six UFO sightings.

a) Let $n = \#$ students
 $n > 50$

b) Let $u = \#$ UFO sightings
 $u < 6$

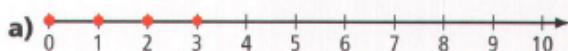
6. Write a mathematical statement to model each situation. Define your variables.
- There are at least 16 slices of pizza.
 - Renting a video costs no more than \$6.
 - Lisa lives more than 3 km from the school.

a) $n = \#$ pizza slices
 $n \geq 16$

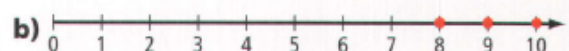
b) $v =$ cost of video
 $v \leq 6$

c) $d =$ distance from school
 $d > 3$

8. Write each model as an inequality using $>$ or $<$.



$$x < 4$$

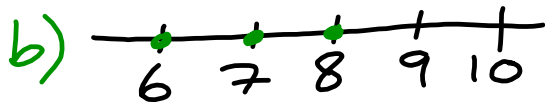
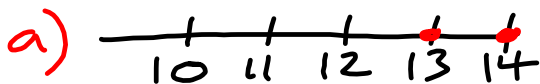


$$x > 7$$

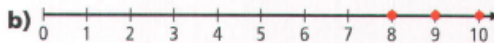
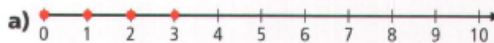
9. Use a number line to show the whole number solution set for each inequality.

a) $m > 12$

b) $9 > p$



11. Write each model as an inequality using \geq or \leq .



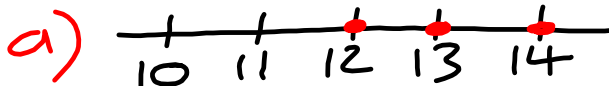
a) $x \leq 3$

b) $x \geq 8$

12. Use a number line to show the whole number solution set for each inequality.

a) $m \geq 12$

b) $9 \geq p$



14. Miranda sells used books. If she triples her sales, she will still sell no more than 18 books.

a) Model this situation with an inequality.

b) How many books has Miranda sold?

a) Let $x = \#$ sales
Triple sales = $3x$
 $\Rightarrow 3x \leq 18$

b) $\frac{3x}{3} \leq \frac{18}{3}$

$x \leq 6$
 \Rightarrow She has sold no more than 6 books.

15. There are fewer than 72 people at the dance. Forty boys are there.

a) Model this situation with an inequality

b) How many girls might be at the dance?

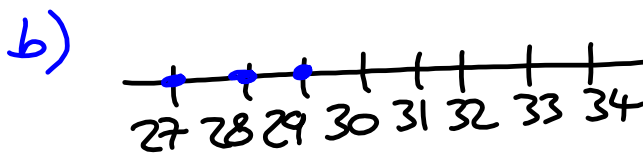
a) Let $x = \#$ of girls
40 boys there
 $\Rightarrow x + 40 < 72$

b) $x + 40 < 72$
 $x + 40 - 40 < 72 - 40$
 $x < 32$
 \Rightarrow Fewer than 32 girls.

16. Students sign up to go on a canoe trip.

- a) Fewer than 30 students want to go. Write an inequality to model this.
- b) Show your solution on a number line.
- c) One teacher is needed for every six students. Write a number sentence to model the number of teachers needed.
- d) If four teachers are available, how many students might be allowed to go? Explain your reasoning.

a) $n = \# \text{ of students}$
 $\Rightarrow n < 30$



c) $t = \# \text{ teachers}$
 $n = \# \text{ students}$
 $\Rightarrow n \leq 6t$

d) $n < 6t$
 $n < 6(4)$
 $n \leq 24$
 $\Rightarrow 24 \text{ students or fewer.}$

17. Write the whole number solution set for each inequality.

- a) $n - 8 < 14$
- b) $2t \geq 18$
- c) $15 \leq 3x$
- d) $6 > s + 2$

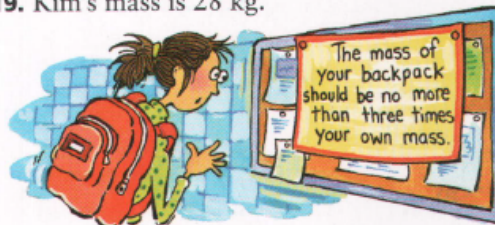
a) $n - 8 < 14$
 $n - 8 + 8 < 14 + 8$
 $n < 22$

b) $\frac{2t}{2} \geq \frac{18}{2}$
 $t \geq 9$

c) $\frac{15}{3} \leq \frac{3x}{3}$
 $5 \leq x$

d) $6 > s + 2$
 $6 - 2 > s + 2 - 2$
 $4 > s$

19. Kim's mass is 28 kg.



- a) Write an inequality to model the mass of Kim's backpack.
- b) Write the whole number solution set to your inequality.

a) $m = \text{mass of backpack}$

$m \leq 3(28)$

$m \leq 84$

b) $m \leq 84$
 $\Rightarrow 84, 83, 82, 81, 80, \dots$