Number line

Adapted from a curriculum written by Alexander Shen, Moscow, Russia

1. Where is the midpoint of a segment if its endpoints are at 17 and 33?

2. Where are the points that divide the segment with endpoints -4 and 1 in these proportions?

(a) 2:3

(b) 3:4

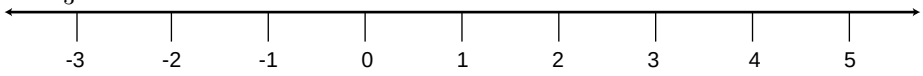
3. A point at x on a number line was moved 5 units to the left. Where is it now?

4. A point at x^2 on a number line lies to the right of a point at x. What value can x have?

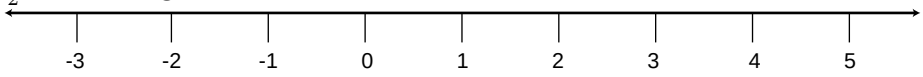
5. Where is the midpoint of a segment if its endpoints are at a and b?

6. On these number lines, mark all points x such that

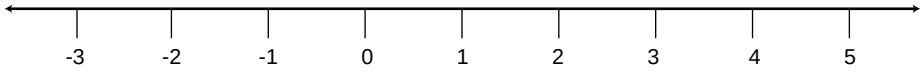
(a) $x - \frac{1}{3}$ is an integer:



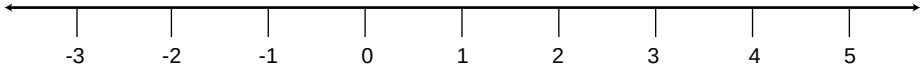
(b) $\frac{x}{2}$ is an integer:



(c) $2x$ is an integer:



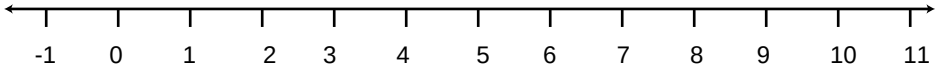
(d) $x - 2 \leq 2x$:



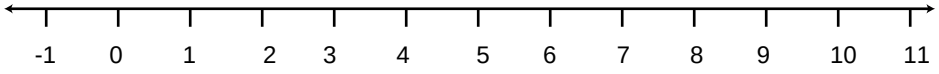
7. On a number line, mark all points x so that among inequalities

$$x > 1, x > 2, \ldots, x > 9, x > 10$$

(a) exactly three are true:



(b) an even number is true:



Answers

1. 25

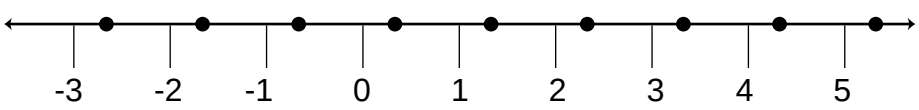
2. (a) -2 or -1
(b) $-1\frac{1}{7}$ or $-1\frac{6}{7}$

3. $x - 5$

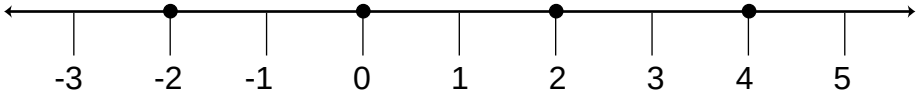
4. $x < 0$ or $x > 1$

5. $\frac{a+b}{2}$

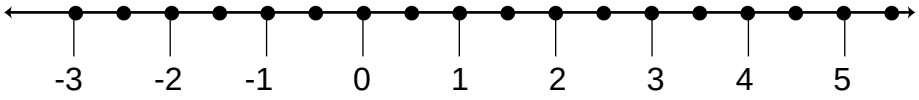
6. (a)



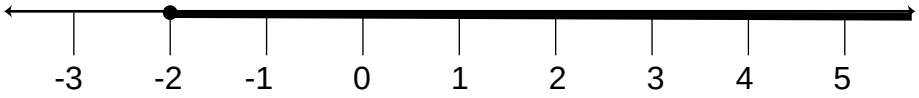
(b)



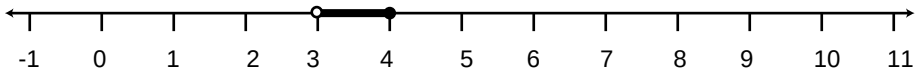
(c)



(d)



7. (a)



(b)