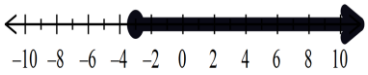
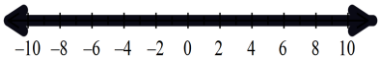
**SM3 4.4 answers**

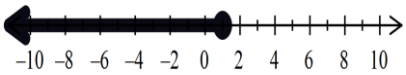
1. $[-3, \infty)$, $\{x|x \geq -3\}$



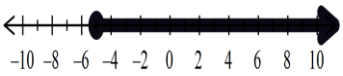

2. $(-\infty, \infty)$, $\{x|x \text{ is all real numbers}\}$



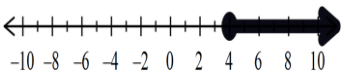

3. $(-\infty, 1]$, $\{x|x \leq 1\}$



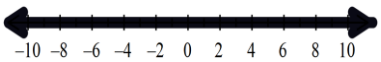

4. $[-5, \infty)$, $\{x|x \geq -5\}$



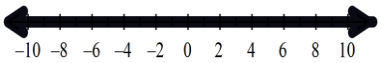

5. $[4, \infty)$, $\{x|x \geq 4\}$



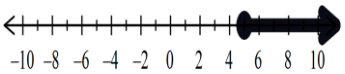

6. $(-\infty, \infty)$, $\{x|x \text{ is all real numbers}\}$



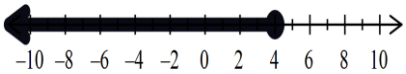

7. $(-\infty, \infty)$, $\{x|x \text{ is all real numbers}\}$



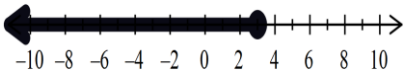

8. $[5, \infty)$, $\{x|x \geq 5\}$




9. $(-\infty, 4]$, $\{x|x \leq 4\}$




10. $(-\infty, 3]$, $\{x|x \leq 3\}$




11. Domain: $(-\infty, \infty)$
Range: $(-\infty, \infty)$
x-intercept: $(4, 0)$
y-intercept: $(0, 2)$
Increasing: N/A
Decreasing: $(-\infty, \infty)$
Constant: N/A
Positive: $(-\infty, 4)$
Negative: $(4, \infty)$
Max/Min: N/A
Symmetry: N/A
$\lim_{x \to -\infty} f(x) = \infty \quad \lim_{x \to \infty} f(x) = -\infty$

12. Domain: $[-8, \infty)$
Range: $(-\infty, 3]$
x-intercept: $(1, 0)$
y-intercept: $(0, 1)$
Increasing: N/A
Decreasing: $(-2, \infty)$
Constant: $(-8, -2)$
Positive: $[-8, 1)$
Negative: $(1, \infty)$
Max: 3
Symmetry: N/A
$\lim_{x \to -\infty} f(x) = \text{N/A} \quad \lim_{x \to \infty} f(x) = -\infty$

13. Domain: $(-\infty, \infty)$
Range: $(-\infty, 6]$
x-intercept: $(-4, 0)$
y-intercept: $(0, 6)$
Increasing: $(-\infty, -2)$
Decreasing: N/A
Constant: $(-2, \infty)$
Positive: $(-4, \infty)$
Negative: $(-\infty, -4)$
Max: 6
Symmetry: N/A
$\lim_{x \to -\infty} f(x) = -\infty \quad \lim_{x \to \infty} f(x) = 6$

14. Domain: $(-\infty,\ \infty)$
Range: $[-7, \infty)$
x-intercept: $(-5, 0), (9, 0)$
y-intercept: $(0, -5)$
Increasing: $(2, \infty)$
Decreasing: $(-\infty, 2)$
Constant: N/A
Positive: $(-\infty, -5) \cup (9,\ \infty)$
Negative: $(-5, 9)$
Min: $(2, -7)$
Symmetry: N/A
$\lim_{x\to-\infty} f(x) = \infty \quad \lim_{x\to\infty} f(x) = \infty$

15. Domain: $(-\infty,\ \infty)$
Range: $(-\infty, 9]$
x-intercept: $(-5, 0), (1, 0)$
y-intercept: $(0, 5)$
Increasing: $(-\infty, -2)$
Decreasing: $(-2, \infty)$
Constant: N/A
Positive: $(-5,\ 1)$
Negative: $(-\infty, -5) \cup (1,\ \infty)$
Max: $(-2, 9)$
Symmetry: N/A
$\lim_{x\to-\infty} f(x) = -\infty \quad \lim_{x\to\infty} f(x) = -\infty$

16. Domain: $(-\infty,\ \infty)$
Range: $(-\infty,\ \infty)$
x-intercept: $(1, 0), (2, 0)$
y-intercept: $(0, 2)$
Increasing: $(-\infty, 0) \cup (2,\ \infty)$
Decreasing: $(0,\ 2)$
Constant: $(-1, 2) \cup (2,\ \infty)$
Positive: $(-\infty, 2)$
Negative: $(4,\ \infty)$
Max: $(0, 2)$ Min: $(2, 0)$
Symmetry: N/A
$\lim_{x\to-\infty} f(x) = \infty \quad \lim_{x\to\infty} f(x) = \infty$

17. Domain: $[-4, \infty)$
Range: $[0, \infty)$
x-intercept: $(-4, 0)$
y-intercept: $(0,2)$
Increasing: $(-4, \infty)$
Decreasing: N/A
Constant: N/A
Positive: $(-4,\ \infty)$
Negative: N/A
Min: $(-4, 0)$
Symmetry: N/A
$\lim_{x\to-\infty} f(x) = \text{N/A} \quad \lim_{x\to\infty} f(x) = \infty$

18. Domain: $(-\infty, -2) \cup (-2,\ \infty)$
Range: $[-4, \infty)$
x-intercept: $(7, 0)$
y-intercept: $(0, -2)$
Increasing: $(5, \infty)$
Decreasing: $(-\infty, -2)$
Constant: $(-2, 5)$
Positive: $(-\infty, -2) \cup (7,\ \infty)$
Negative: $(-2, 7)$
Min: $(5, -4)$
Symmetry: N/A
$\lim_{x\to-\infty} f(x) = \infty \quad \lim_{x\to\infty} f(x) = \infty$