

Problem 1 Which of the following is equivalent to: $(-2, \infty)$?

Multiple Choice:

- (a) $\{x \in \mathbb{R} : x < -2\}$
- (b) $\{x \in \mathbb{R} : x > -2\}$ ✓
- (c) $\{x \in \mathbb{R} : x \leq -2\}$
- (d) $\{x \in \mathbb{R} : x \geq -2\}$
- (e) $\{x \in \mathbb{R} : x < 2\}$
- (f) $\{x \in \mathbb{R} : x > 2\}$
- (g) $\{x \in \mathbb{R} : x \leq 2\}$
- (h) $\{x \in \mathbb{R} : x \geq 2\}$

Feedback(attempt): Set notation should have the open brace and then the dummy variable (usually with what kind of number it is) hence the “ $\{x \in \mathbb{R}$ ” above is saying “the set of all x , a real number”. The colon should be translated as a “such that” and what follows is the condition that the variable needs to adhere to, followed by the closing brace. Thus for example: the set “ $\{x \in \mathbb{R} : x > 3\}$ ” is saying “the set of all x , a real number, such that x is strictly larger than 3.”

Since we want “ $(-2, \infty)$ ” we want x to be strictly (since we have a parenthesis) larger than -2 and less than “ ∞ ”. But clearly any number is less than infinity, so we can simplify this to just “ x strictly larger -2 .” We then just need to put it in the correct format with the braces and using the correct inequality sign!.

Problem 2 Which of the following is equivalent to: $\{x \in \mathbb{R} : x > -2\}$?

Multiple Choice:

- (a) $(-\infty, 3]$
- (b) $(-\infty, 3)$
- (c) $(3, +\infty)$ ✓
- (d) $[3, +\infty)$
- (e) $(-\infty, -3]$
- (f) $(-\infty, -3)$

(g) $[-3, +\infty)$

(h) $(-3, +\infty)$

Feedback(attempt): Remember that strict inequalities (i.e. “ $>$ ” or “ $<$ ”) need parenthesis and non-strict (i.e. “ \leq ” or “ \geq ”) inequalities use brackets. You also need to account for both endpoints. So if you are trying to interpret $x > 5$ then you need “ x strictly larger than 5”, you would want the interval $(5, \infty)$; the initial “(” is because it is a strict inequality, and the “ ∞ ” is because you need the other “endpoint” (which, since we want “anything bigger than 5”, must be infinity since there is no upper bound given; note that infinity always gets a parenthesis since we don’t include it as a “number”).

Problem 3 Which of the following is equivalent to: $(3, \infty)$?

Multiple Choice:

(a) $\{x \in \mathbb{R} : x < 3\}$

(b) $\{x \in \mathbb{R} : x > 3\}$ ✓

(c) $\{x \in \mathbb{R} : x \leq 3\}$

(d) $\{x \in \mathbb{R} : x \geq 3\}$

(e) $\{x \in \mathbb{R} : x < -3\}$

(f) $\{x \in \mathbb{R} : x > -3\}$

(g) $\{x \in \mathbb{R} : x \leq -3\}$

(h) $\{x \in \mathbb{R} : x \geq -3\}$

Feedback(attempt): Since we want “ $(3, \infty)$ ” we want x to be strictly (since we have a parenthesis) larger than 3 and less than “ ∞ ”. But clearly any number is less than infinity, so we can simplify this to just “ x strictly larger 3.” We then just need to put it in the correct format with the braces and using the correct inequality sign!.

Problem 4 Which of the following is equivalent to: $\{x \in \mathbb{R} : x < -8\}$?

Multiple Choice:

(a) $(-\infty, -8]$

(b) $[-8, +\infty)$

- (c) $(-8, +\infty)$
- (d) $(-\infty, 8]$
- (e) $(-\infty, 8)$
- (f) $(-\infty, -8)$ ✓
- (g) $[8, +\infty)$
- (h) $(8, +\infty)$

Feedback(attempt): Remember that strict inequalities (i.e. “ $>$ ” or “ $<$ ”) need parenthesis and non-strict (i.e. “ \leq ” or “ \geq ”) inequalities use brackets. You also need to account for both endpoints. So if you are trying to interpret $x > 5$ then you need “ x strictly larger than 5”, you would want the interval $(5, \infty)$; the initial “(” is because it is a strict inequality, and the “ ∞ ” is because you need the other “endpoint” (which, since we want “anything bigger than 5”, must be infinity since there is no upper bound given; note that infinity always gets a parenthesis since we don’t include it as a “number”).

Problem 5 Which of the following is equivalent to: $(4, \infty)$?

Multiple Choice:

- (a) $\{x \in \mathbb{R} : x < 4\}$
- (b) $\{x \in \mathbb{R} : x > 4\}$ ✓
- (c) $\{x \in \mathbb{R} : x \leq 4\}$
- (d) $\{x \in \mathbb{R} : x \geq 4\}$
- (e) $\{x \in \mathbb{R} : x < -4\}$
- (f) $\{x \in \mathbb{R} : x > -4\}$
- (g) $\{x \in \mathbb{R} : x \leq -4\}$
- (h) $\{x \in \mathbb{R} : x \geq -4\}$

Feedback(attempt): Since we want “ $(4, \infty)$ ” we want x to be strictly (since we have a parenthesis) larger than 4 and less than “ ∞ ”. But clearly any number is less than infinity, so we can simplify this to just “ x strictly larger 4.” We then just need to put it in the correct format with the braces and using the correct inequality sign!.

Problem 6 Which of the following is equivalent to: $\{x \in \mathbb{R} : x < 3\}$?

Multiple Choice:

- (a) $(-\infty, 3]$
- (b) $[3, +\infty)$
- (c) $(3, +\infty)$
- (d) $(-\infty, -3]$
- (e) $(-\infty, -3)$
- (f) $[-3, +\infty)$
- (g) $(-3, +\infty)$
- (h) $(-\infty, 3)$ ✓

Feedback(attempt): Remember that strict inequalities (i.e. “ $>$ ” or “ $<$ ”) need parenthesis and non-strict (i.e. “ \leq ” or “ \geq ”) inequalities use brackets. You also need to account for both endpoints. So if you are trying to interpret $x > 5$ then you need “ x strictly larger than 5”, you would want the interval $(5, \infty)$; the initial “(” is because it is a strict inequality, and the “ ∞ ” is because you need the other “endpoint” (which, since we want “anything bigger than 5”, must be infinity since there is no upper bound given; note that infinity always gets a parenthesis since we don’t include it as a “number”).