

Truth Test Track

Test numbers in linear inequalities.

GRADE 6 • 6.PFA.4.d

6.PFA.4.d "Use substitution or a number line graph to justify whether a given number in a specified set makes a linear inequality in one variable true."

NAME _____

DATE _____

TEST IT OUT

To test whether a number makes an inequality true, substitute the number for x and compare the two sides. If the comparison is true, the number is a solution. A number line graph can also show whether a number is in the solution set.

WORKED EXAMPLE

For x in the whole numbers, does $x = 4$ make $6x + 8 \geq 32$ true?

1. Substitute 4 for x : $6(4) + 8 \geq 32$.
2. Multiply: $24 + 8 \geq 32$.
3. Add: $32 \geq 32$.
4. The statement is true because both sides are equal.

Answer: Yes, $x = 4$ is a solution.

PRACTICE 6 problems

- 1** For x in the whole numbers, does $x = 9$ make $x + 7 > 12$ true? Show substitution or use a number line graph.

ANSWER _____

- 2** For x in the integers, does $x = 9$ make $2x - 5 \leq 13$ true? Show substitution or use a number line graph.

ANSWER _____

- 3** For x in the whole numbers, does $x = 5$ make $5x + 1 < 26$ true? Show substitution or use a number line graph.

ANSWER _____

- 4** For x in the whole numbers, does $x = 15$ make $x/5 + 7 \geq 10$ true? Show substitution or use a number line graph.

ANSWER _____

- 5** For x in the integers, does $x = 7$ make $17 - 2x > 5$ true? Show substitution or use a number line graph.

ANSWER _____

- 6** For x in the whole numbers, does $x = 5$ make $5x \leq 29$ true? Show substitution or use a number line graph.

ANSWER _____

APPLY IT Show your work

- 1** A game club gives 3 points for each quest you finish, plus 5 bonus points. You need at least 23 points to unlock a new level. If x is the number of quests and $x = 7$, does $3x + 5 \geq 23$ show that you unlock the level? Show substitution or use a number line graph.

WORK SPACE

ANSWER _____

- 2** A music app charges 9 dollars for a monthly pass and 2 dollars for each song pack. You can spend no more than 25 dollars. If x is the number of song packs and $x = 9$, does $2x + 9 \leq 25$ show that the purchase is within budget? Show substitution or use a number line graph.

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

The possible values of x are $\{2, 5, 7, 9\}$. Which values make $2x + 1 \leq 15$ true? Show a substitution for each value you choose and explain why the other value does not work.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	For x in the whole numbers, does $x = 9$ make $x + 7 > 12$ true? Show substitution or use a number line graph.	Yes. $9 + 7 = 16$, and $16 > 12$.
2	For x in the integers, does $x = 9$ make $2x - 5 \leq 13$ true? Show substitution or use a number line graph.	Yes. $2(9) - 5 = 13$, and $13 \leq 13$.
3	For x in the whole numbers, does $x = 5$ make $5x + 1 < 26$ true? Show substitution or use a number line graph.	No. $5(5) + 1 = 26$, and 26 is not less than 26.
4	For x in the whole numbers, does $x = 15$ make $x/5 + 7 \geq 10$ true? Show substitution or use a number line graph.	Yes. $15/5 + 7 = 10$, and $10 \geq 10$.
5	For x in the integers, does $x = 7$ make $17 - 2x > 5$ true? Show substitution or use a number line graph.	No. $17 - 2(7) = 3$, and 3 is not greater than 5.
6	For x in the whole numbers, does $x = 5$ make $5x \leq 29$ true? Show substitution or use a number line graph.	Yes. $5(5) = 25$, and $25 \leq 29$.

PART 2 • APPLY IT

- Yes. $3(7) + 5 = 26$, and $26 \geq 23$.** Substitute 7 for x . The total is 26 points, which is at least 23 points.
- No. $2(9) + 9 = 27$, and 27 is not less than or equal to 25.** Substitute 9 for x . The cost is 27 dollars, which is more than the 25-dollar budget.

CHALLENGE

$x = 2, 5$, and 7 . $2(2) + 1 = 5 \leq 15$, $2(5) + 1 = 11 \leq 15$, and $2(7) + 1 = 15 \leq 15$. For $x = 9$, $2(9) + 1 = 19$, and $19 > 15$.

Accept correct substitution work or a correct number line graph. Accept equality as true for $\leq$ or $\geq$ because the endpoint is included.