

Name: _____

Translation Rules

The purpose of a translation rule is to tell you how to move a point, whether that point is on a graph or simply written as coordinates. A set of coordinates is simple to **translate** (move) according to a given rule. All you have to do is follow the rule. If it says, " $x + 4$," then add 4 to the x -value. That's it.

Translate each point according to the given rule.

$(x, y) \rightarrow (x + 6, y - 2)$		
EXAMPLE $(3, -4)$ <i>The rule:</i> $(x, y) \rightarrow (x + 6, y - 2)$ <i>The point:</i> $(3, -4) \rightarrow (3 + 6, -4 - 2)$ <div style="border: 1px solid black; display: inline-block; padding: 2px;">$(9, -6)$</div>	1. $(9, 5)$	2. $(-7, 18)$
3. $(-6, -6)$	4. $(0, 2)$	5. $(8, 19)$

$(x, y) \rightarrow (x - 8, y + 4)$		
6. $(4, -2)$	7. $(8, 6)$	8. $(15, -7)$
9. $(-3, 7)$	10. $(10, -10)$	11. $(6, 6)$

$(x, y) \rightarrow (x - 5, y - 7)$		
12. $(12, -2)$	13. $(7, 4)$	14. $(13, 9)$
15. $(-2, -6)$	16. $(5, 4)$	17. $(-8, -3)$

$(x, y) \rightarrow (x + 11, y - 12)$		
18. $(1, 1)$	19. $(0, -3)$	20. $(16, -7)$
21. $(-10, 6)$	22. $(31, -14)$	23. $(1, 5)$

Up to this point, we've used a rule to translate from point to point. Now, we're going to look at the process from the other direction—we're going to write the rules instead of following them. Translation rules identify changes in x and in y to tell you how to move a point. That means that you can identify the change in x and y in a set of given points and write the rule from that information.

To find the change in x , subtract: $(\text{ending } x\text{-value}) - (\text{starting } x\text{-value})$.

To find the change in y , subtract: $(\text{ending } y\text{-value}) - (\text{starting } y\text{-value})$.

Write the rule for translation from point A to point B .

<p>EXAMPLE $A(6, 4)$ & $B(-3, 9)$ <i>First, identify the start and the end.</i> <i>The directions say "from point A to point B," so B is the end.</i></p> <p><i>Change in $x = \text{end} - \text{start}$</i> $= -3 - 6 = -9$, so it's $x-9$</p> <p><i>Change in $y = \text{end} - \text{start}$</i> $= 9 - 4 = 5$, so it's $y + 5$</p> <p>The rule is: $(x, y) \rightarrow (x - 9, y + 5)$</p>	<p>24. $A(4, 7)$ & $B(3, 8)$</p>	<p>25. $A(8, 2)$ & $B(5, -4)$</p>
<p>26. $A(-19, 5)$ & $B(6, 2)$</p>	<p>27. $A(30, 6)$ & $B(40, 16)$</p>	<p>28. $A(-1, 0)$ & $B(0, 5)$</p>
<p>29. $A(9, 2)$ & $B(5, 17)$</p>	<p>30. $A(8, 7)$ & $B(8, 12)$</p>	<p>31. $A(4, 9)$ & $B(11, 6)$</p>
<p>32. $A(3, 3)$ & $B(9, -9)$</p>	<p>33. $A(20, 21)$ & $B(22, -23)$</p>	<p>34. $A(-6, -4)$ & $B(-8, -11)$</p>