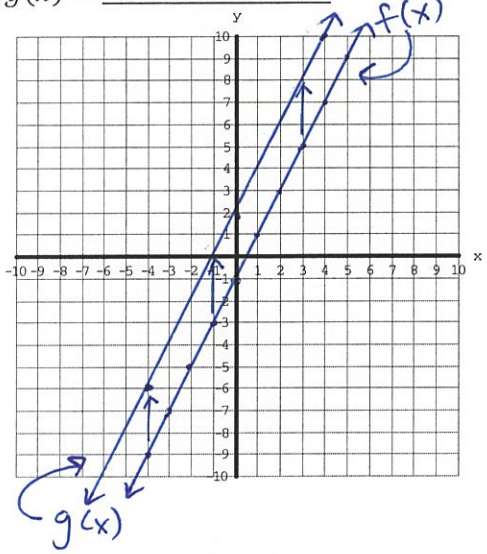
Module 7 Review

Key

You are given the equation of $f(x)$ and the transformation $g(x)$. Graph both $f(x)$ and $g(x)$ *and* write the linear equation for $g(x)$ below the graph.

1. $f(x) = 2x - 1$
   $g(x) = f(x) + 3$

$g(x) =$ $2x+2$



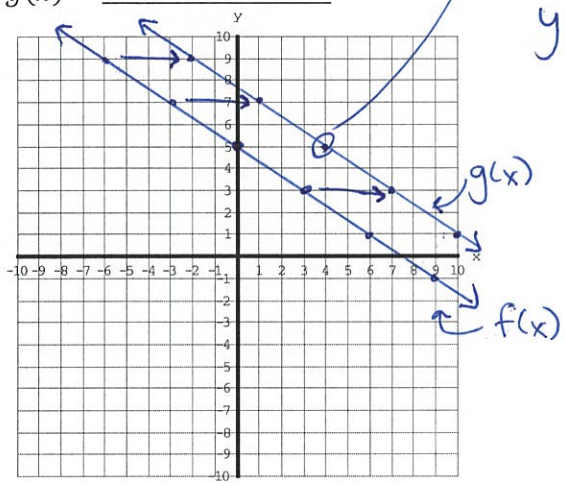
2. $f(x) = -\frac{2}{3}x + 5$
   $g(x) = f(x - 4)$

$y = -\frac{2}{3}(x-4)+5$

$y = -\frac{2}{3}x + \frac{8}{3} + 5$

$y = -\frac{2}{3}x + 7\frac{2}{3}$

$g(x) =$ $-\frac{2}{3}x + 7\frac{2}{3}$



You are given information about $f(x)$ and $g(x)$. Rewrite $g(x)$ in translation form: $g(x) = f(x) + k$

4. $f(x) = 7x + 13$
   $g(x) = 7x + 4$

$g(x) =$ $f(x)-9$
Translation form

5. $f(x) = 22x - 12$
   $g(x) = 22x + 8$

$g(x) =$ $f(x)+20$
Translation form

7.

x	$f(x)$	$g(x)$
3	11	26
10	46	61
25	121	136
40	196	211

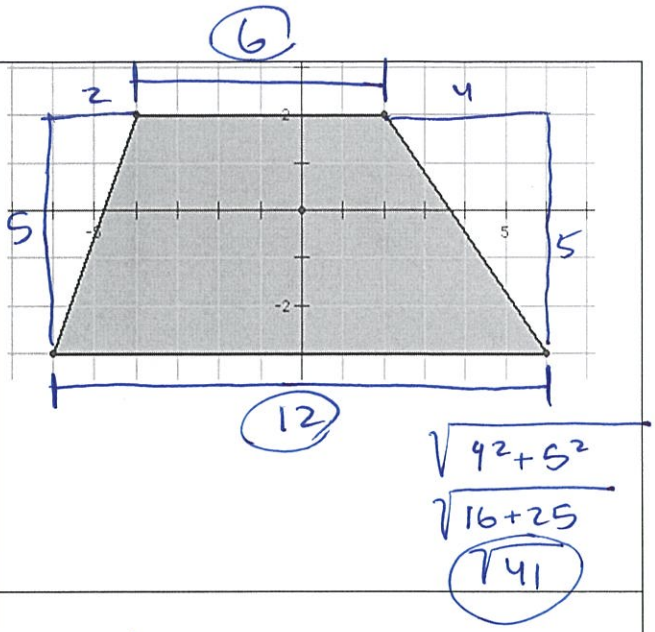
$g(x) =$ $f(x)+15$
Translation form

8.

x	$f(x)$	$g(x)$
-4	5	-42
-1	-1	-48
5	-13	-60
20	-43	-90

$g(x) =$ $f(x)-47$
Translation form

Find the perimeter of the figure on the right.



$6 + \sqrt{41} + 12 + \sqrt{29}$

$18 + \sqrt{41} + \sqrt{29}$

$\sqrt{2^2+5^2}$

$\sqrt{4+25}$

$\sqrt{29}$

$\sqrt{4^2+5^2}$

$\sqrt{16+25}$

$\sqrt{41}$

Find the slope and the distance between

(4, -6) and (3, -12)

$m = \frac{-12+6}{3-4} = \frac{-6}{-1} = \frac{6}{1}$

Slope = $\frac{6}{1}$

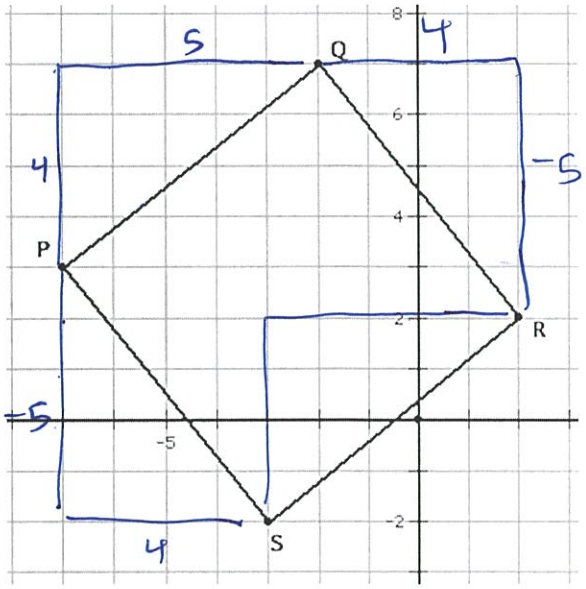
Distance = $\sqrt{37}$

$\sqrt{6^2+1^2}$

$\sqrt{36+1}$

$\sqrt{37}$

Prove that quadrilateral PQRS on the graph is a rectangle.



Goal: PQRS is a rectangle

WTS:

$\overline{PQ} \perp \overline{QR}$ ✓	$\overline{QR} \perp \overline{RS}$ ✓
$\overline{RS} \perp \overline{PS}$ ✓	$\overline{PS} \perp \overline{PQ}$ ✓

Evidence:

$m\overline{PQ} = \frac{4}{5}$

$m\overline{QR} = -\frac{5}{4}$

$m\overline{RS} = \frac{4}{5}$

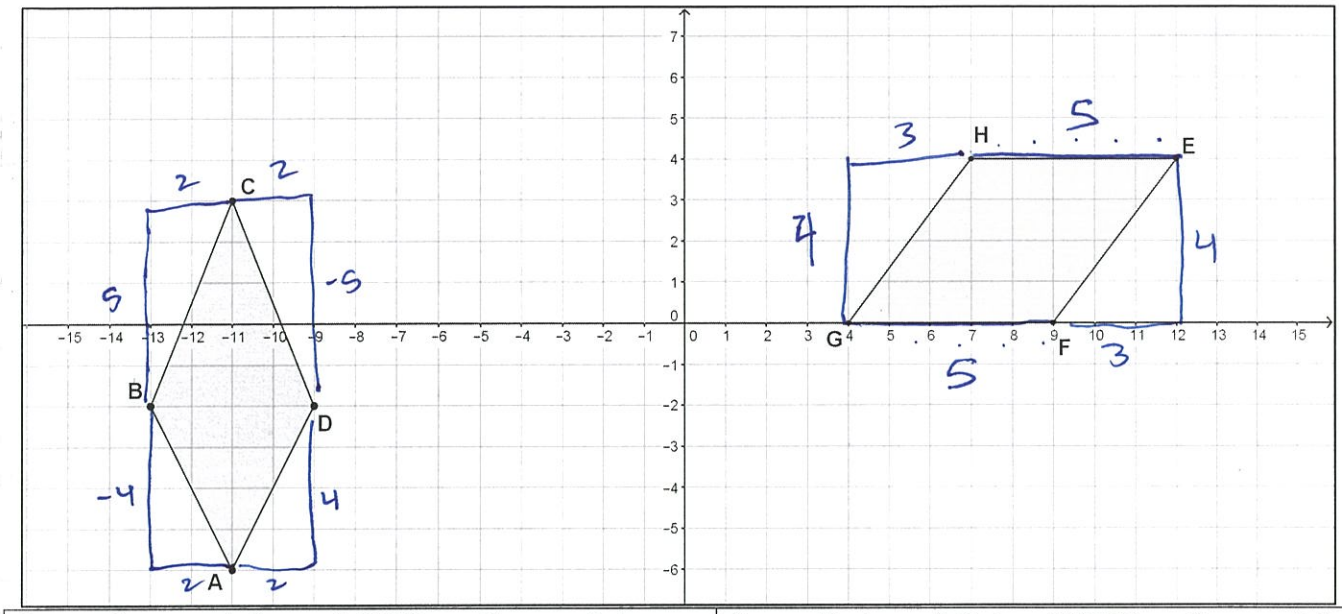
$m\overline{PS} = -\frac{5}{4}$

$\frac{4}{5}$ $-\frac{5}{4}$

opposite ✓

reciprocal ✓

Conclusion: since all pairs of adjacent sides are $\perp$, all angles are $\cong$ and PQRS is a rectangle



Prove that quadrilateral ABCD on the graph is a parallelogram.

Goal: ABCD is a parallelogram

WTS:

$\overline{AB} \parallel \overline{CD}$ ✗	$\overline{BC} \parallel \overline{AD}$ ✗
N/A	N/A

Evidence:

$m\overline{AB} = \frac{-4}{2}$

$m\overline{BC} = \frac{5}{2}$

$m\overline{CD} = \frac{-5}{2}$

$m\overline{AD} = \frac{4}{2}$

$-\frac{4}{2} \quad -\frac{5}{2}$

not the same so not $\parallel$.

Conclusion: Since opposite sides are not the same slope, ABCD is not a parallelogram.

Prove that quadrilateral EFGH on the graph is a rhombus.

Goal: EFGH is a rhombus

WTS:

$\overline{EF} \cong \overline{FG} \cong \overline{GH} \cong \overline{HE}$ ✓

Evidence:

$EF = 5$

$FG = 5$

$GH = 5$

$HE = 5$

$\sqrt{3^2+4^2}$

$\sqrt{9+16}$

$\sqrt{25}$

5

Conclusion: Since all sides are $\cong$, EFGH is a rhombus.