

I. Simplify the following expressions. Show each step completely. Work vertically. Positive exponents in answer.

<p>(a) $\frac{12 - \frac{1}{4} \cdot 6^3}{5(10 - 7) - 4 \cdot 2}$</p>	<p>(b) $\frac{81^{\frac{3}{4}} + (5 - 8)4 - 6^2}{49^{\frac{1}{2}} - (8^2 - 4^3)}$</p>	<p>(c) $(x^{-5}y^6)^3(-3x^2y^{-5})^{-4}$</p>	<p>(d) $\left(\frac{-18x^4y^{-1}}{12xy^{-5}}\right)^{-3}$</p>
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II. Find the domain and range for the given relations. State whether or not it's a function.

<p>(a) </p> <p>D: R:</p> <p>yes / no</p>	<p>(b) </p> <p>D: R:</p> <p>yes / no</p>	<p>(c) </p> <p>D: R:</p> <p>yes / no</p>	<p>(d) </p> <p>D: R:</p> <p>yes / no</p>	<p>(e) <table border="1" style="display: inline-table; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>x</th> <th>y</th> </tr> </thead> <tbody> <tr> <td>7</td> <td>3</td> </tr> <tr> <td>3</td> <td>5</td> </tr> <tr> <td>0</td> <td>7</td> </tr> <tr> <td>3</td> <td>9</td> </tr> <tr> <td>7</td> <td>11</td> </tr> </tbody> </table></p> <p>D: R:</p> <p>yes / no</p>	x	y	7	3	3	5	0	7	3	9	7	11
x	y															
7	3															
3	5															
0	7															
3	9															
7	11															

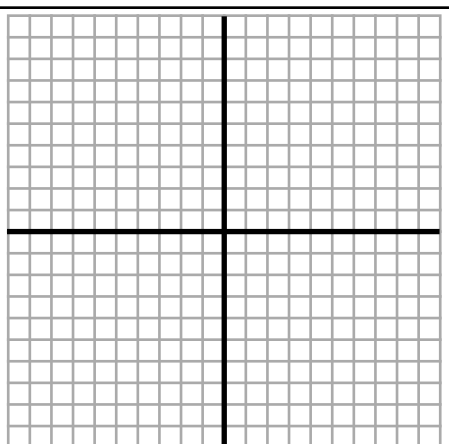
III. For $f(x) = -4x + 3$ and $g(x) = x^2 - 7$, find each new function and write it in simplest form. Show each step.

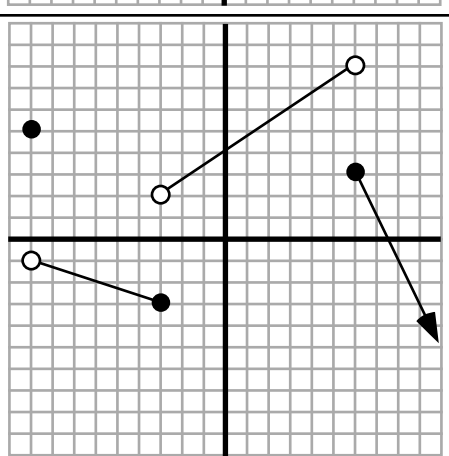
<p>$f \circ g(x)$</p>	<p>$g \circ f(x)$</p>	<p>$f \circ f(x)$</p>	<p>$g \circ g(x)$</p>
<p>(a) $f \circ g(-5)$</p>	<p>(c) $g \circ f(6)$</p>	<p>(e) $f \circ f(x^2 - 2)$</p>	<p>(g) $g \circ g(2a)$</p>
<p>(b)</p>	<p>(d)</p>	<p>(f)</p>	<p>(h)</p>

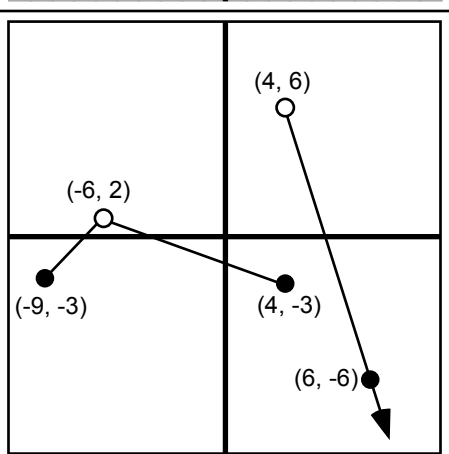
IV. Find the inverse for each of the following functions. Use compositions of functions to check your answer.

$f(x) = 3x - 5$	$f \circ f^{-1}(x)$	$g(x) = -\frac{3}{4}x + \frac{5}{8}$	$g \circ g^{-1}(x)$
(a)	$f^{-1} \circ f(x)$	(b)	$g^{-1} \circ g(x)$

V. Graph the piecewise function in (a) and find the piecewise function which describes the graphs in (b) & (c).

<p>(a)</p> $f(x) = \begin{cases} -\frac{1}{2}x + 5 & ; -6 \leq x < 2 \\ 6 & ; 2 < x < 5 \\ 2x - 7 & ; x \geq 5 \end{cases}$	<p>evaluate:</p> $f(-4)$ $f(2)$ $f(5)$	
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<p>(b)</p>	<p>evaluate:</p> $f(-9)$ $f(-3)$ $f(3)$	
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<p>(c)</p>	<p>evaluate:</p> $f(-6)$ $f(4)$ $f(8)$	
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