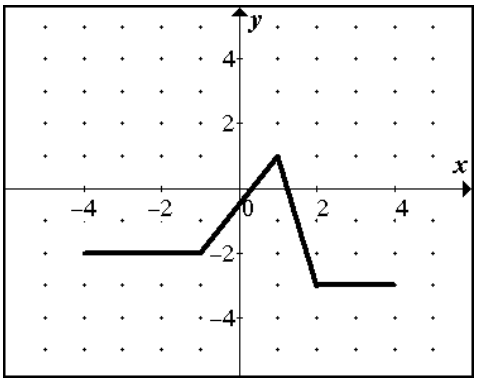
Transformations of Functions (Answers)

Date:

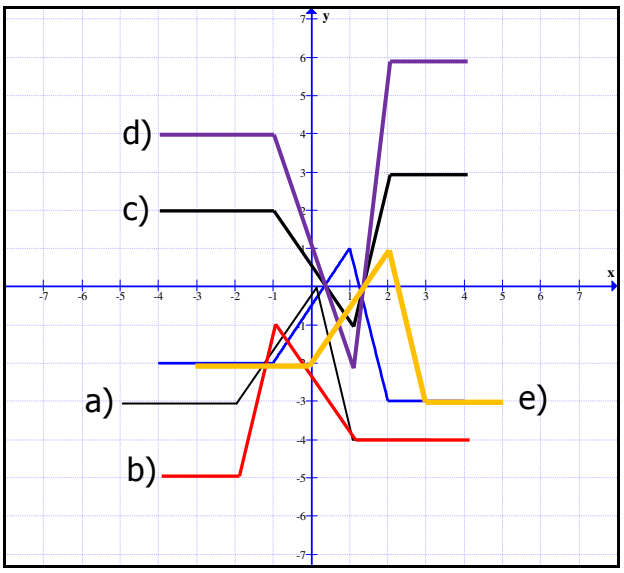
1. Define $y = f(x)$ as a piecewise function:

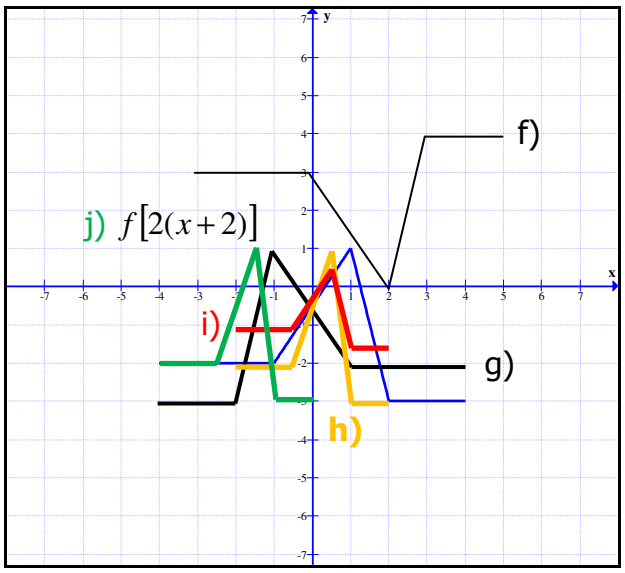
$$f(x) = \begin{cases} -2 & , -4 \le x \le -1 \\ \frac{3}{2}x - \frac{1}{2} & -1 < x \le 1 \\ -4x + 5 & 1 < x \le 2 \\ -3 & 2 < x \le 4 \end{cases}$$



Answers may vary because the endpoints must NOT overlap (otherwise this would fail the vertical line test).

2. For the given function $y = f(x)$, sketch the transformed functions (5 functions per set of axes).





a) $y = f(x+1) - 1$ b) $y = f(-x) - 2$ c) $y = -f(x)$ d) $y = -2f(x)$ e) $y = f(x-2)$

f) $y = -f(x-1) + 1$ g) $y = f(-x)$ h) $y = f(2x)$ i) $y = \frac{1}{2}f(2x)$ j) $y = f(2x+4)$

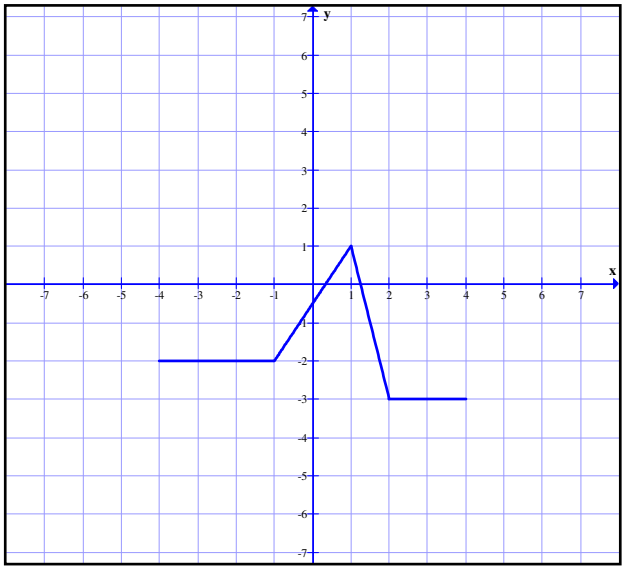
k) $y = -f(x) + 2$

l) $y = -f(-2x)$

m) $y = f(\frac{1}{2}x)$

n) $y = f(-x-1)$

o) $y = f(-x) + 2$



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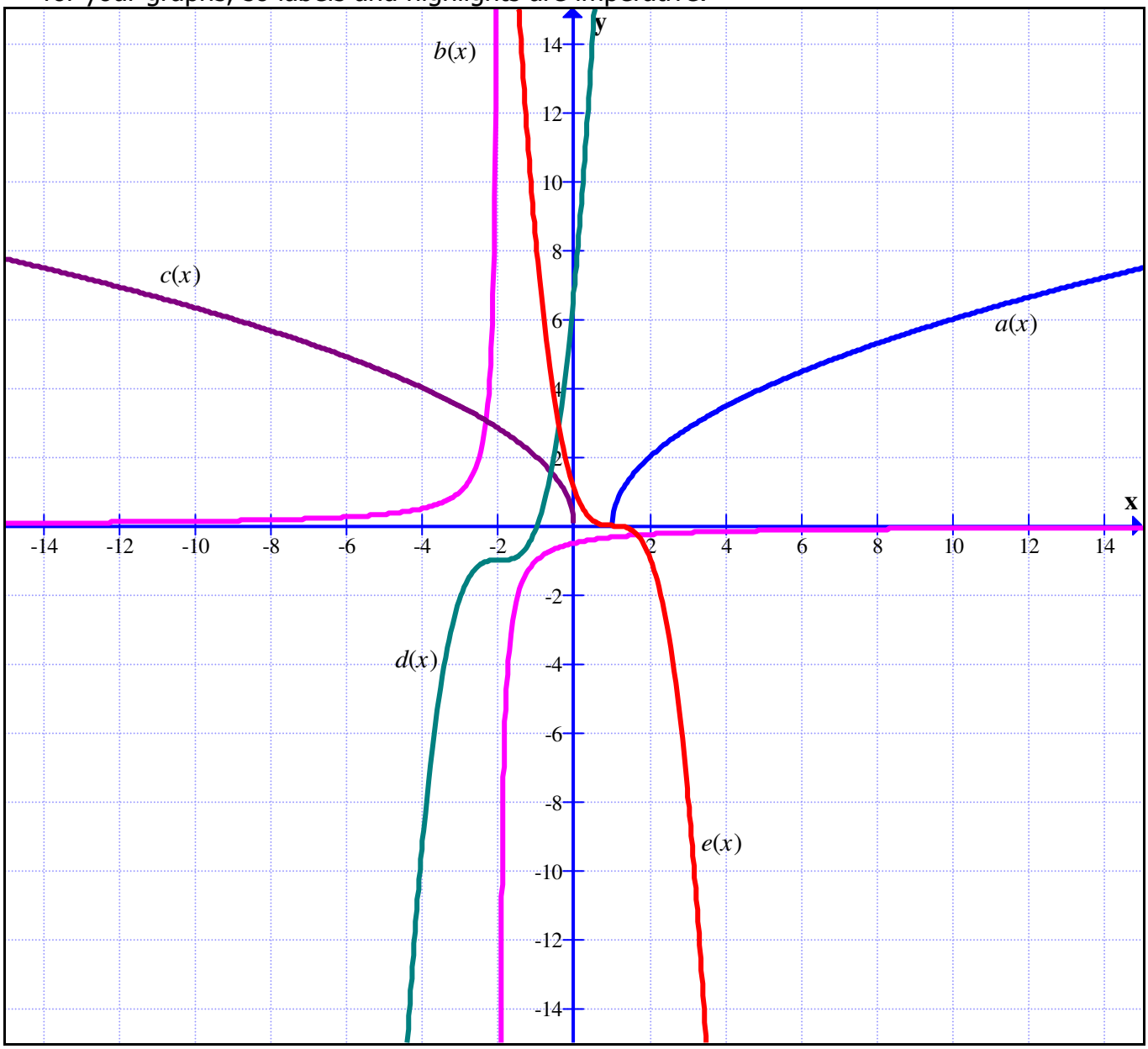
3. State the values of a, k, p and q and sketch the following equations. Two axes are provided for your graphs, so labels and highlights are imperative.



$a(x) = 2\sqrt{x-1}$ $b(x) = -\dfrac{1}{x+2}$ $c(x) = 2\sqrt{-x}$ $d(x) = (x+2)^3 - 1$ $e(x) = -(x-1)^3$

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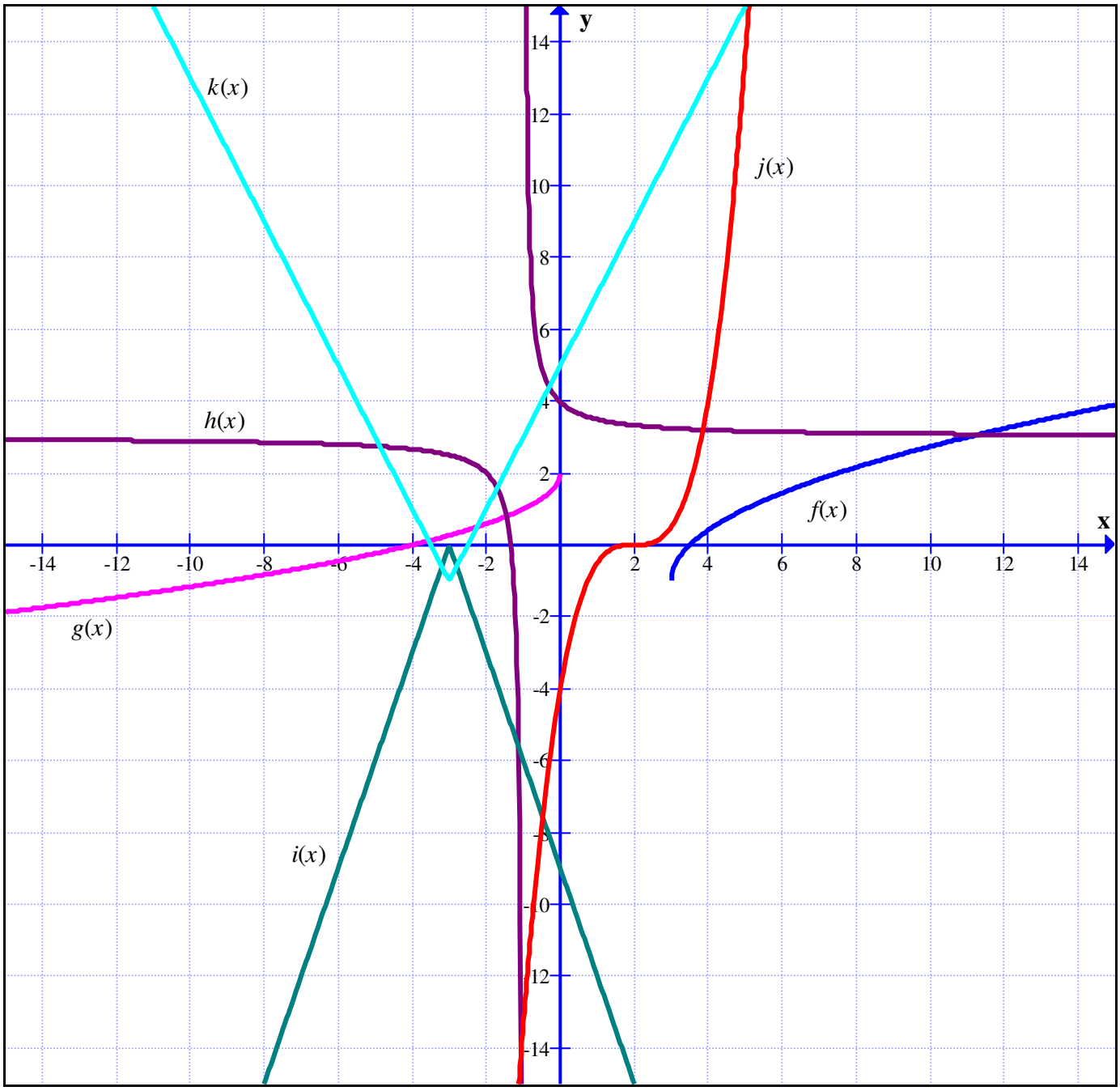
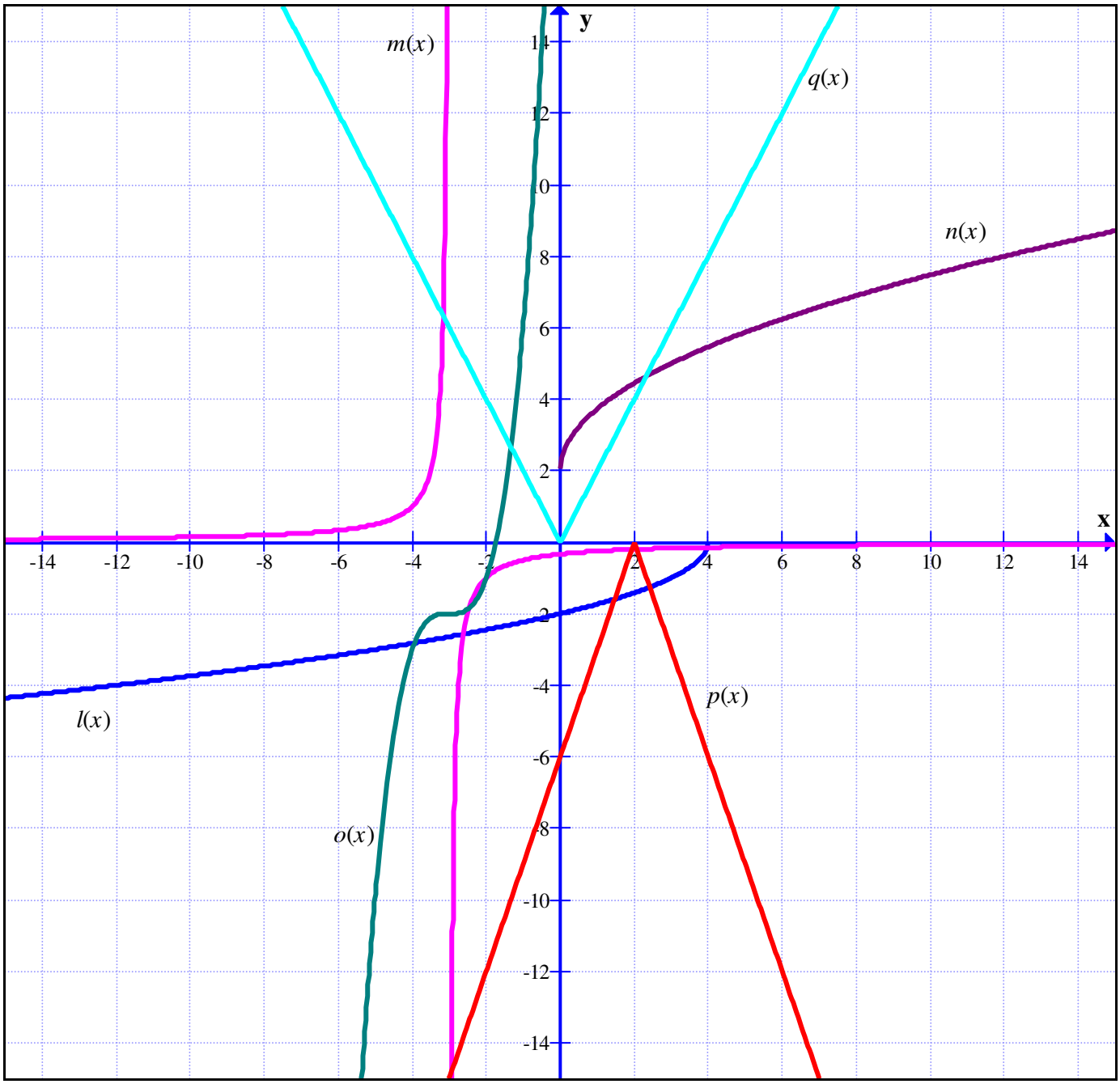


$f(x)=\sqrt{2x-6}-1$ $g(x)=-\sqrt{-x}+2$ $h(x)=\dfrac{1}{x+1}+3$

$i(x)=-3|x+3|$ $j(x)=\dfrac{1}{2}(x-2)^3$ $k(x)=2|x+3|-1$

Transformations of Functions (Answers)

Date:



$l(x) = -\sqrt{-(x-4)}$

$m(x) = \dfrac{-1}{x+3}$

$n(x) = \sqrt{3x} + 2$

$o(x) = (x+3)^3 - 2$

$p(x) = -3|x-2|$

$q(x) = 2|x|$

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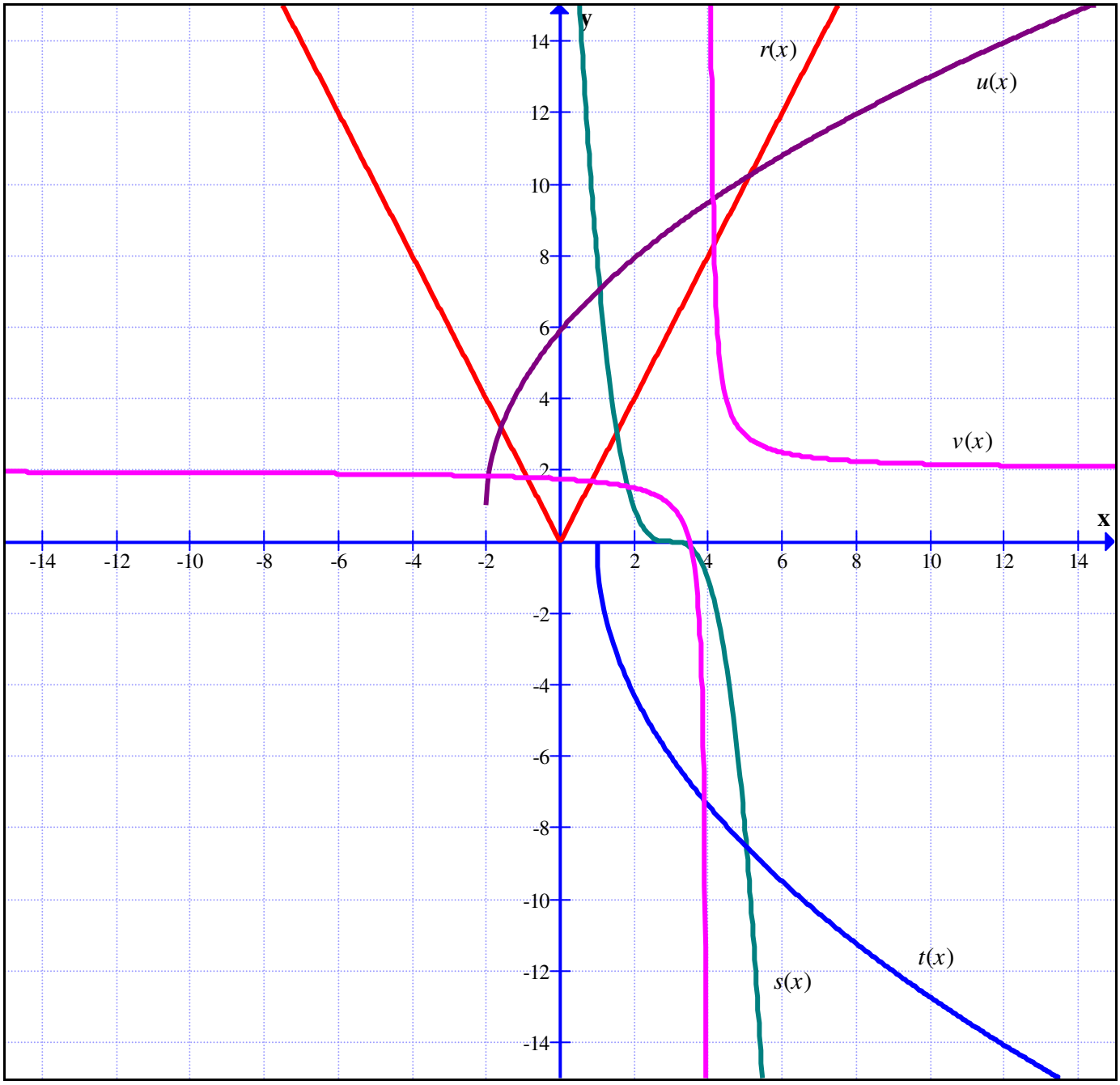

$r(x) = |2x|$

$s(x) = -(x-3)^3$

$t(x) = -3\sqrt{2(x-1)}$

$u(x) = 2\sqrt{3x+6}+1$

$v(x) = -\dfrac{1}{4-x}+2$