COLLEGE ALGEBRA QUIZ

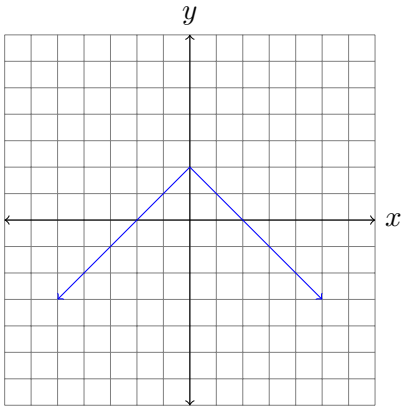
(1) Find the inverse of the relation. $\{(1.5, -2.8), (9, -3), (-7, 3), (6, -3), (8, -5)\}$
Solution: $\{(-2.8, 1.5), (-3, 9), (3, -7), (-3, 6), (-5, 8)\}$

(2) Given $y = -2x + 7$, find an equation of the inverse relation.
Solution: $x = -2y + 7$

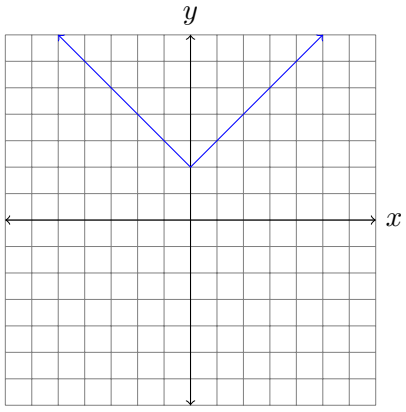
(3) Given $0.85x^3 - 4.5y^2 = 3x$, find an equation of the inverse relation.
Solution: $0.85y^3 - 4.5x^2 = 3y$

(4) Given $f(x) = -|x| + 2$,
(a) Choose the correct graph.

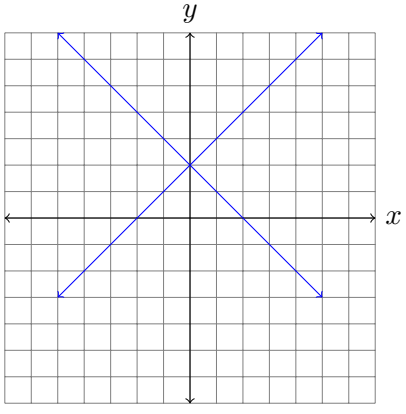
(i)



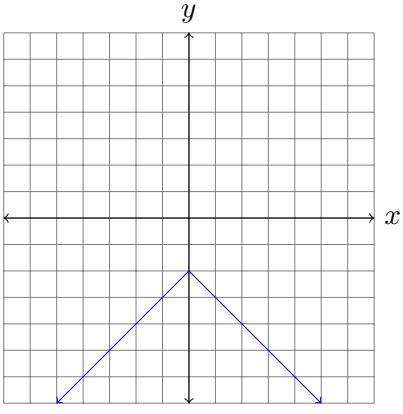
(ii)



(iii)



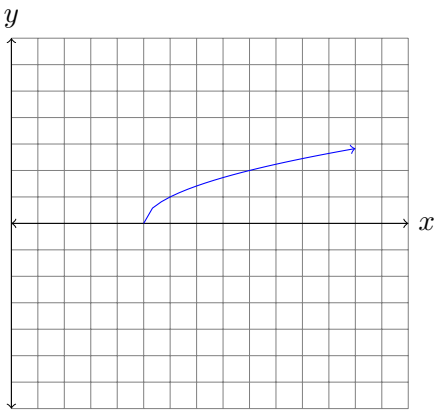
(iv)



Solution: (i)

(b) Is this function one to one? (use the horizontal line test)
Solution: No.

(5) Given, $f(x) = \sqrt{x-5}$
(a) Which of the following is the graph of $f(x)$?

(i)


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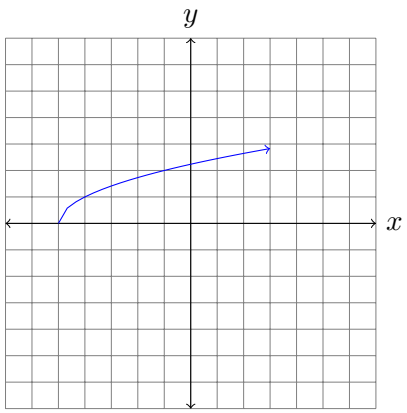

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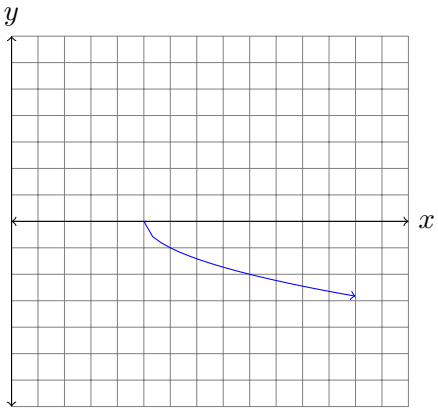
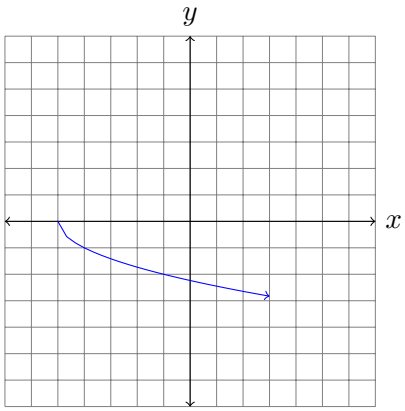
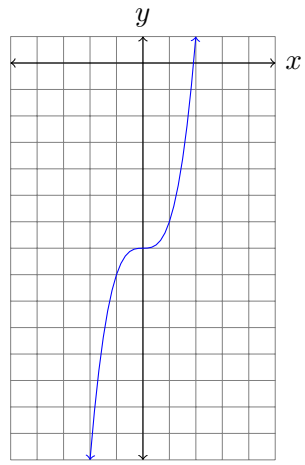
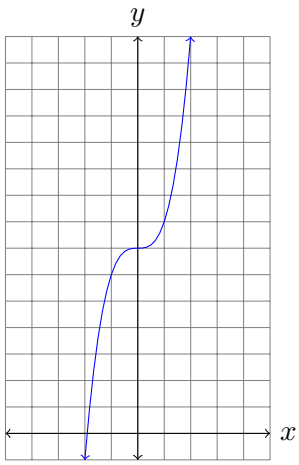


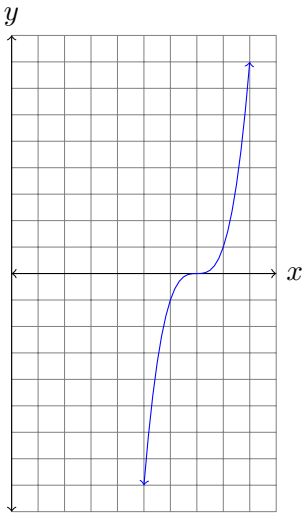
(iv)


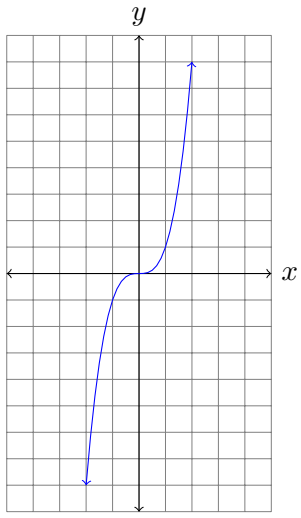
Solution: (a)
(b) If the function is one-to-one then find the formula for the inverse function.
Solution: $f^{(-1)}(x) = x^2 + 5$

(6) Given, $f(x) = x^3 - 7$
(a) Which of the following is the graph of $f(x)$?

(i) 

(ii) 

(iii) 

(iv) 

(b) If the function is one-to-one then find the formula for the inverse function.
Solution: $f^{(-1)} = \sqrt[3]{x+7}$ or $f^{(-1)} = (x+7)^{\frac{1}{3}}$

(7) Given $f(x) = 9x - 2$ and $f^{-1}(x) = \frac{x+2}{9}$,
(a) Is the composition, $(f^{-1} \circ f)(x)$ equivalent to x? (yes or no)
Solution: yes
(b) Is the composition, $(f \circ f^{-1})(x)$, equivalent to x (yes or no)?
Solution: yes
(c) According to the composition of functions, is $f^{-1}(x) = \frac{x+5}{6}$ the inverse function for $f(x) = 6x - 5$? (yes or no)
Solution: yes

(8) Given the following one-to-one function, $f(x) = \frac{x-5}{x+2}$,

(a) What is the inverse function, $f^{-1}(x)$, of $f(x)$?

Solution: $f^{-1} = \frac{2x+5}{1-x}$

(b) What is the domain and range of $f(x)$?

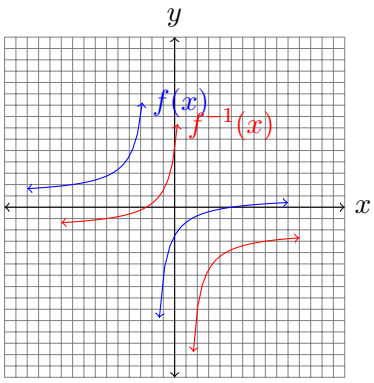
Solution: $(-\infty, -2) \cup (-2, \infty)$; $(-\infty, 1) \cup (1, \infty)$

(c) What is the domain and range of $f^{-1}(x)$?

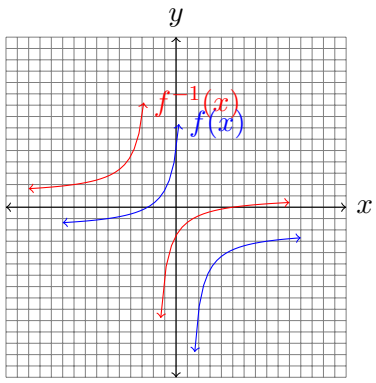
Solution: $(-\infty, 1) \cup (1, \infty)$; $(-\infty, -2) \cup (-2, \infty)$

(d) Which of the following is the graph of $f(x)$ and $f^{-1}(x)$?

(i)



(ii)



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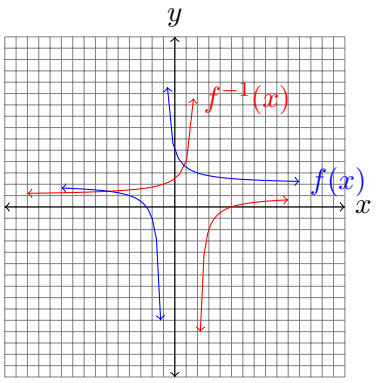

(iv)