

Key.

Practice Test Pre-Cal 12

1. What transformations can you apply to $y=\sqrt{x}$ to obtain the graph of each function? State the domain and range in each case.

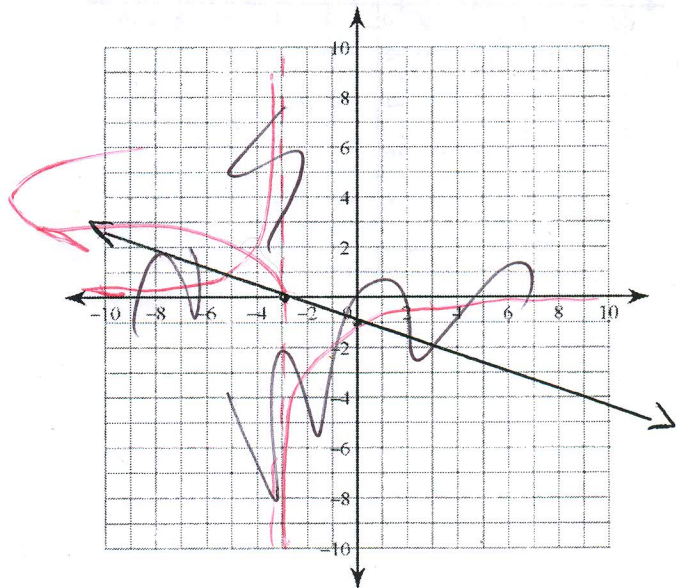
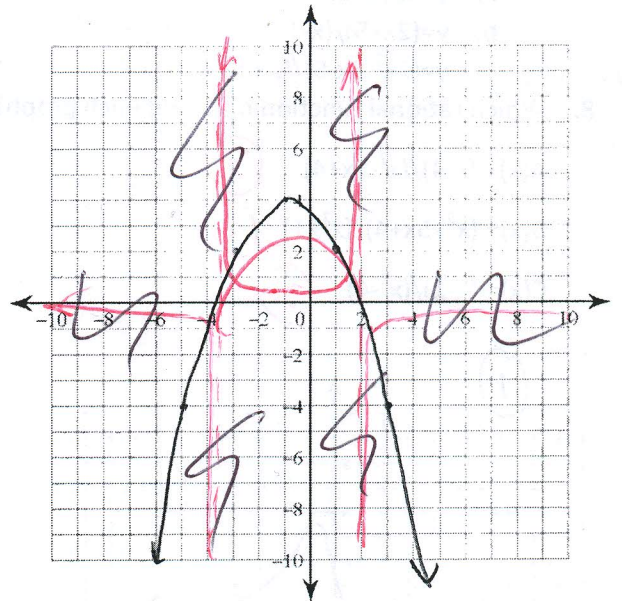
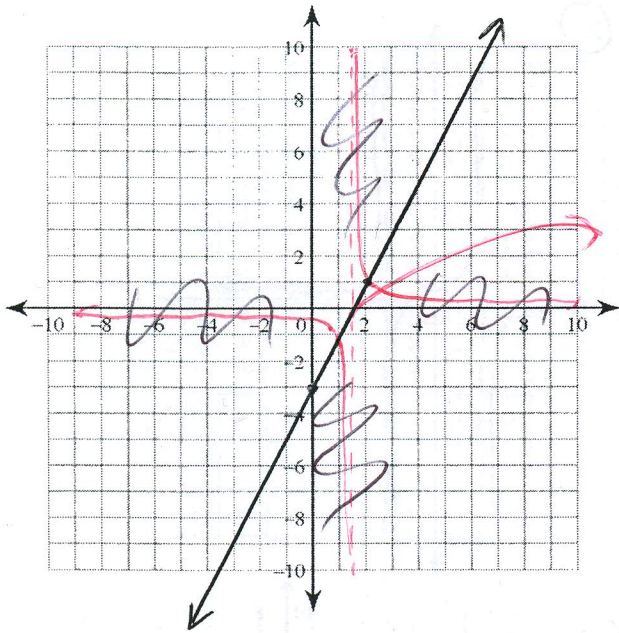
- a. $y=5\sqrt{x+20}$ V.E. by a factor of 5. V.T 5 units up.
 b. $y=\sqrt{-2x-8}$ H.C by a factor of $\frac{1}{2}$. H. reflection, ~~V.T 8~~ down. 4 units right.
 c. $y=-\sqrt{1/6}(x-11)$ H.E by 6. right 11. V.T.

2. Identify and compare the domains and ranges of the function in each pair and explain why they differ.

- a. $y=4-x^2$ and $y=\sqrt{4-x^2}$ D: all real #'s. D: $-2 \leq x \leq 2$. | $y \leq 4$ | $0 \leq y \leq 2$.
 b. $y=2x^2+24$ and $y=\sqrt{2x^2+24}$ D: all real #'s. D: all real #'s. | $24 \leq y$ | $\sqrt{24} \leq y$
 c. $y=x^2-6x$ and $y=\sqrt{x^2-6x}$ D: all real #'s. D: $x \leq 0, 6 \leq x$ | $-9 \leq y$ | $0 \leq y$

3. a) Determine the root(s) of the equation $\sqrt{x+3}-7=0$ algebraically $x=46$.
 b) Use a graph to locate the x-intercept(s) of the function $f(x)=\sqrt{x+3}-7$
 c) Use you answers to describe the connection between the x-intercepts of the graph of a function and the roots of the corresponding equation. Same.

4. Using each graph of $y=f(x)$ sketch the graph of $y=\sqrt{f(x)}$



5. The speed s in m/s of water flowing out of a hole near the bottom of a tank related to the height h in meters of the water above the hole by the formula $s = \sqrt{2gh}$. In the formula g represents the acceleration due to gravity 9.8 m/s^2 . At what height is the water flowing out a speed of 9 m/s ?

4.13 m.

$$\begin{aligned} 4\sqrt{2x} &= 1 \\ 16(2x) &= 1 \\ x &= \frac{1}{32} \end{aligned}$$

6. solve each equation algebraically

- a. $\sqrt{5x+14}=9$ no solution.
 b. $7 + \sqrt{8-x}=12$ -17.
 c. $23 - 4\sqrt{2x-10}=12$ $\frac{1}{32}$
 d. $x+3 = \sqrt{18-2x^2}$ $x = -3 \text{ or } 1$

$$\begin{aligned} x^2 + 6x + 9 &= 18 - 2x^2 \\ 3x^2 + 6x - 9 &= 0 \\ 3(x^2 + 2x - 3) &= 0 \\ x &= -3 \text{ or } 1 \end{aligned}$$

7. Graph each function and identify any asymptotes and intercepts

- a. $y = x/(x+2)$ asympt: $x = -2$ | $y = 0$ | $x = 0$
 b. $y = (2x+5)/(x-1)$ A: $x = 1$ | $y = -5$ | $x = -\frac{5}{2}$
 c. $y = (2x^2 - 3x - 5)/(2x - 5)$ A: none. | $y = 1$ | $x = -1$

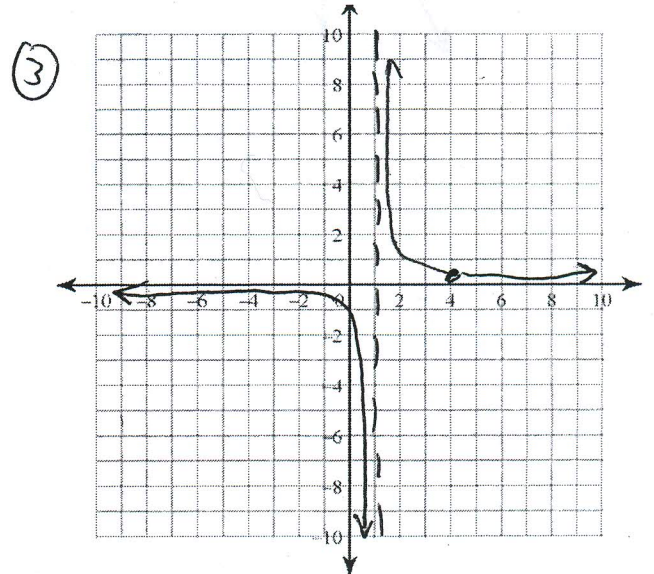
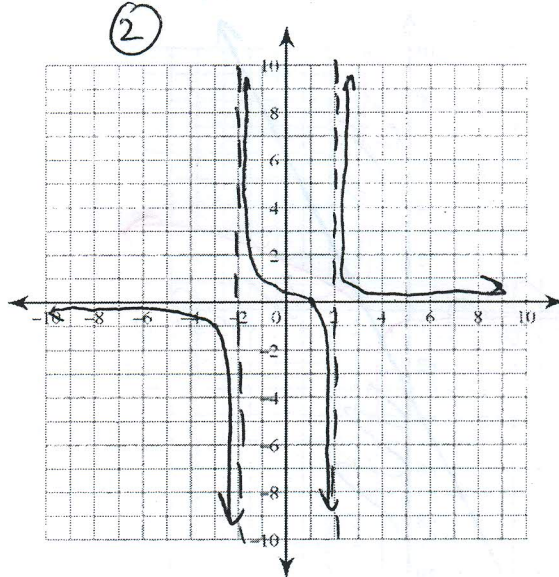
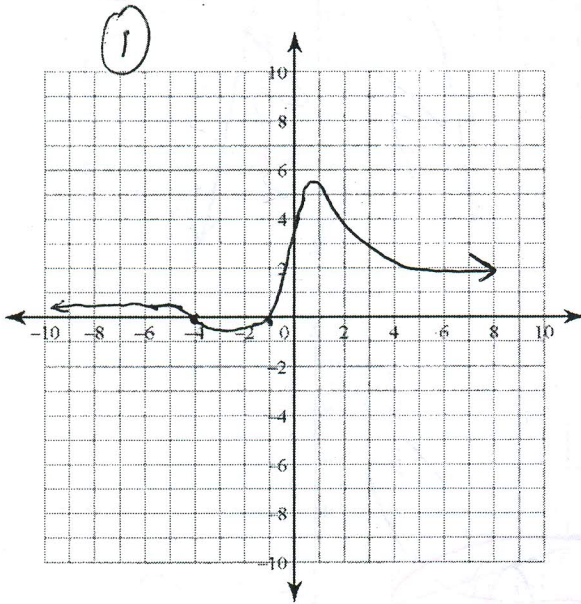
$(2x-5)(x+1)$

8. Which rational function matched each graph? Give reasons for your choices.

$A(x) = (x-4)/(x^2-5x+4)$ (3)

$B(x) = (x^2+5x+4)/(x^2+1)$ (1)

$C(x) = (x-1)/(x^2-4)$ (2)



9. Graph and analyze each function including the behavior near any non-permissible values.

a. $y = (x^2 + 2x) / (x) = \frac{x(x+2)}{x}$

b. $y = (x^2 - 16) / (x - 4)$

c. $y = (2x^2 - 3x - 5) / (2x - 5) = \frac{(2x+5)(x-1)}{(2x-5)}$

