

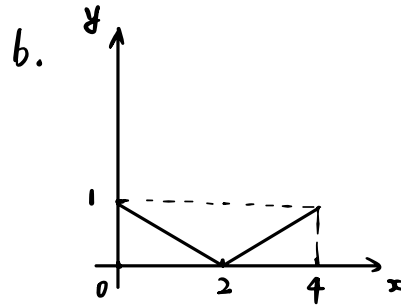
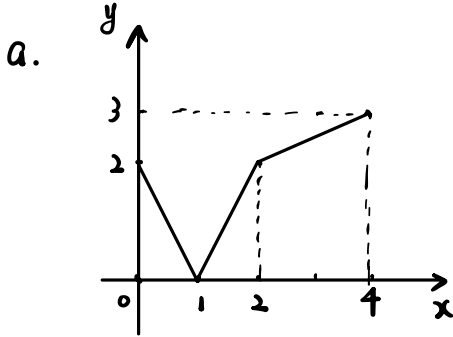
1. Find the domain of these functions:

a. $y = \sqrt{2 - \sqrt{x}}$

b. $y = \sqrt{|x|}$

c. $y = \sqrt{x^2 - 11x + 30}$

2. Find the formula of each graph



3. ① Graph the functions $f(x) = \frac{x}{2}$, $g(x) = 1 + \frac{4}{x}$ together to identify the values of x which

$$\frac{x}{2} > 1 + \frac{4}{x}$$

② Confirm your findings algebraically.

4. Judge that if $f(x) = \sqrt{1-x^2}$ is equal to $g(x) = \sqrt{1-x} \cdot \sqrt{1-x}$

5. Let $f(x) = x + 5$, $g(x) = x^2 - 3$, find the followings:

a. $f(g(0))$

b. $g(f(0))$

c. $g(f(x))$

d. $f(f(-5))$.

6. Let $f(x) = x - 3$ $g(x) = \sqrt{x}$ $h(x) = x^3$ $j(x) = 2x$

Express each of the functions as a composite involving one or more of f , g , h and j .

a. $y = \sqrt{x} - 3$

b. $y = \sqrt{(x-3)^3}$

c. $y = \sqrt{x^3 - 3}$

7. Give the equation for the shifted graph

a. $x^2 + y^2 = 25$ Up 3, left 4

b. $y = \sqrt{x}$ Left 0.9

c. $y = \frac{1}{2}(x+1) + 5$ Down 5, right 1

8. Graph the functions:

a. $y = \sqrt{x+4}$

b. $y = |1-x| - 1$

c. $y = \sin(\frac{3\pi}{2} - x)$

d. $y = (x+2)^{\frac{2}{3}} + 1$

9. Put each ellipse equation in standard form

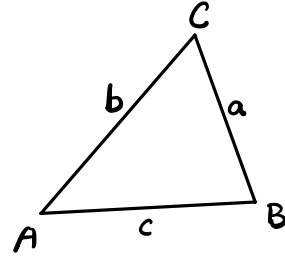
a. $9x^2 + 25y^2 = 225$

b. $6(x + \frac{3}{2})^2 + 9(y - \frac{1}{2})^2 = 54$

10. Derive the formula: $\tan(A+B) = \frac{\tan A + \tan B}{1 - \tan A \tan B}$

11. Prove the identity: $\frac{1 - \cos x}{\sin x} = \frac{\sin x}{1 + \cos x}$ ($\sin x \neq 0$)

12. Show that the area of triangle ABC is given by
 $\frac{1}{2}ab \sin C = \frac{1}{2}bc \sin A = \frac{1}{2}ac \sin B$



13. (Hard) Find all functions $f: \mathbb{R} \rightarrow \mathbb{R}$ satisfying
 $xf(x) + f(2-x) = x + 3$