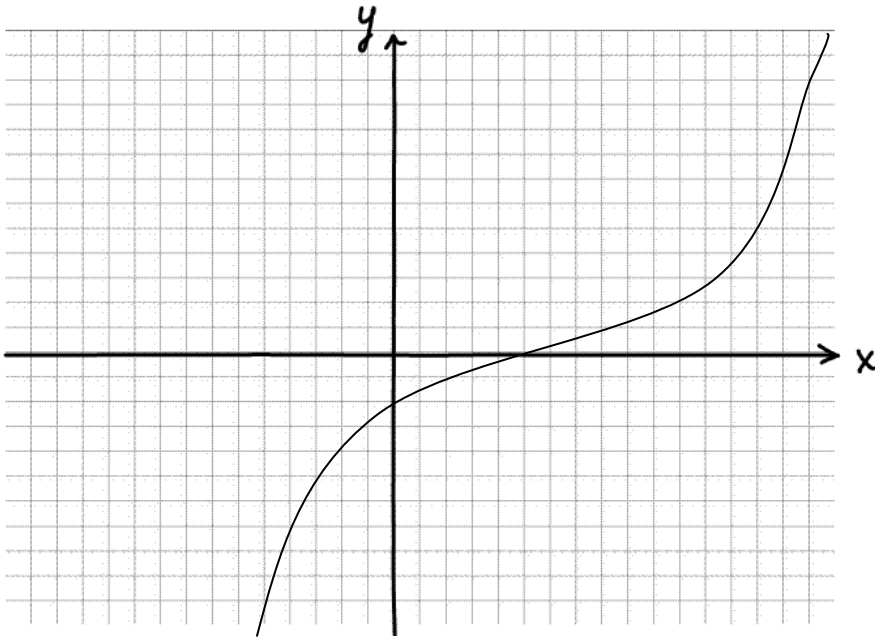
*20 questions
*Calculators allowed
*Show all work/steps- use separate paper
*Recommend time frame 30min -45min

Concept of Functions and Relations

1. True or False: All Relations are Functions?

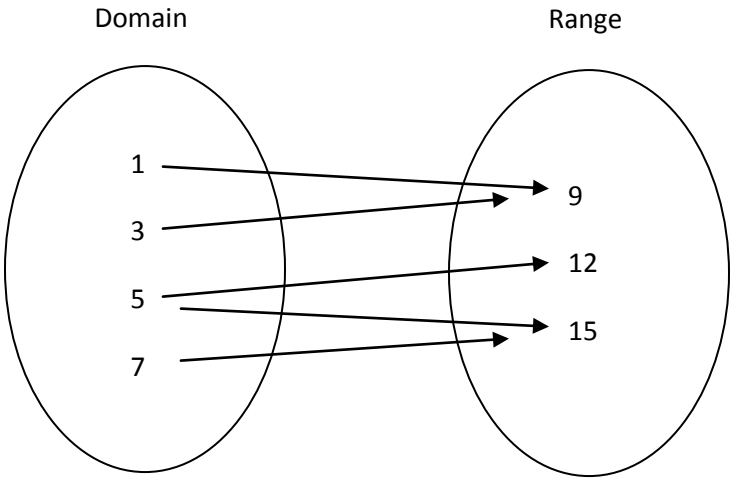
2. Define the Domain of a function in your own words

3. Does the graph represent a function? (justify your answer)



4. What is the range of the following function? $f(x) = x^2$

5. Use the mapping diagram to determine if the relation is a function



6. Is $f(x) = 2x + 4$ a linear function? (explain)

7. What is the "Vertical Line Test?"

Function Operations

Perform the following function operations given $f(x) = 2x + 1$ *and* $g(x) = -\frac{1}{2}x - 3$

8. $f(x) + g(x) =$

9. $-3f(x) - g(x) =$

10. $2f(x)g(x) =$

11. $f\big(g(x)\big) =$

12. $g\big(f(x)\big) =$

Inverse Functions

13. $Are\ \ f(x) = 2x + 4\ and\ g(x) = -\frac{1}{2}x - 2\ \ inverses\ of\ each\ other?\ (explain)$

14. $Find\ the\ inverse\ function\ of\ \ f(x) = 4x - 5$

15. $Find\ the\ inverse\ function\ of\ f(x) = \frac{1}{3}x + 2\ \ and\ verify\ \ your\ answer$

16. $Find\ the\ inverse\ function\ of\ f(x) = 5x - 9\ \ and\ verify\ \ your\ answer$

Graphing Functions

17. $Which\ variable\ effects\ the\ vertical\ movement\ of\ the\ function\ f(x) = mx + b?$

18. $Graph\ the\ function\ f(x) = x^2 + 4$

19. $Graph\ the\ function\ f(x) = -2(x - 3)^2 + 5$

Special Functions

20. $Find\ the\ following\ values\ of\ f(x) = \begin{Bmatrix} 2x + 10\ for\ x \geq -3 \\ x^2\ for\ -10 \leq x < -3 \\ 3x^2 + 5x + 1\ for\ x < -10 \end{Bmatrix}$

    a. $f(5)$

    b. $f(-10)$

    c. $f(-20)$