

Kerry Ojakian's MTH 30 Class
Class Assignment #1

1. Among the following numbers, circle the integers:

$$32, -20, 1/4, -2/3, 3.5, -4, 4\frac{2}{3}, -3\frac{1}{3}$$

2. Among the following numbers, circle the rationals which are **not** integers:

$$32, -20, 1/4, -2/3, 3.5, -4, 4\frac{2}{3}, -3\frac{1}{3}$$

3. Among the following numbers (when simplified), circle the reals which are **not** rationals:

$$32, \sqrt{25}, \sqrt{2}, -23, 3.5, \pi, 4\frac{2}{3}, e$$

4. (a) Find any 4 numbers between -23 and -22 (not including them).
(b) How many integers are between -2 and 108 , including both?
(c) How many rational numbers are between -2 and 108 , including both?
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5. For each operation, state whether or not it is a function (yes/no) and give the reason. If it is a function, write it in function notation.

(a) The operation assigning each country its population.

(b) The operation taking a number to half its value.

(c) The operation assigning to each number its third roots.

(d) The operation assigning to each number its fourth roots.

6. Let $f(t) = 10 - 5t$. Evaluate $f(2)$ and $f(0)$.

7. Let $g(x) = 4 + 3x^2$. Evaluate $g(2)$ and $g(-2)$.

8. Let $h(u) = \frac{5 + u}{u - 5}$. Evaluate $h(0)$ and $h(-1)$.

9. Let $f(x) = 5x - 10$. For what x is the function value positive?

10. Let $f(t) = 10 - 5t$. For what t is the function value negative?

11. Let $g(x) = 4 + 3x^2$. Are $g(20242024)$ and $g(-20242024)$ equal? Why?

12. Let $h(x) = 5 + 2x^3$. Are $h(20242024)$ and $h(-20242024)$ equal? Why?

13. Consider the function f given by the following table.

x	2	4	6	17	15	10
$f(x)$	-3	4	-13	2	0	14

(a) Evaluate $f(17)$

(c) For what x does $f(x) = -13$

(b) Evaluate $f(2)$

(d) Solve $f(x) = 6$.

14. Consider the function f given by the following table.

x	-4	4	0	17	5	10
$f(x)$	-3	4	-13	2	0	0

(a) Evaluate $f(0)$

(c) For what x is $f(x)$ negative?

(b) Solve $f(x) = 0$

(d) Which x value is a “fixed point” of f ?

15. Let $g(x) = 2x - 1$. Evaluate $g(y + 3)$.

16. Let $f(x) = 5 + 2x^3$. Evaluate $f(t)$ and $f(-u)$.

17. Let $h(t) = t^2 - t$. Evaluate $h(-x)$ and $h(x - 1)$.

18. Consider the equation $30x = 10y$. Write y as a function of x .

19. Consider the equation $6x = 8y$. Write x as a function of y .

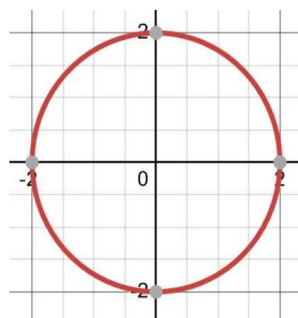
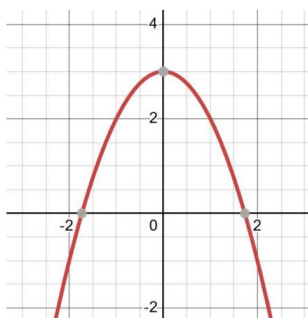
20. Consider the equation $6t = 8y + 4$. Write y as a function of t .

21. Consider the equation $u = 3u + 8x^3 - 4$. Write u as a function of x .

22. Suppose that $f(x) = 7 - 2x$. Solve $f(x) = 11$.

23. Suppose that $h(u) = 20u$. For what u does $h(u) = 50$?

24. Consider the two graphs below. For each one, state whether or not it is the graph of a function.



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25. Draw a graph which is NOT a function. Why is it not a function?

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26. Draw a graph which IS a function. Why is it a function?

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27. Consider the following two relations. For each one, is it a function or not?

(a) $\{(2, 4), (4, 2), (3, 4), (1, 1)\}$

(b) $\{(2, 4), (3, 5), (2, 6), (7, 9)\}$

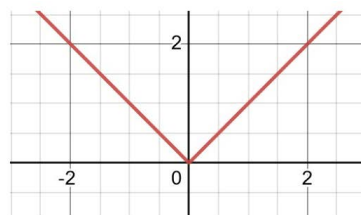
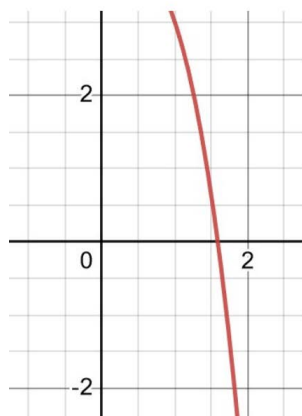
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28. Draw a graph which is a one-to-one function. Why is it a one-to-one function?
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29. Draw a graph which is an injective function. Why is it an injective function?

30. Draw a graph which is a function but not one-to-one. Why is it a non one-to-one function?

31. Draw a graph which is a function but not injective. Why is it a non injective function?

32. Consider functions graphed below. For each one, state whether or not it is one-to-one.



33. Consider the following two relations. For each one, is it a function or not? If it is a function, is it injective?

(a) $\{(-2, 4), (4, 2), (2, 4), (1, 1), (5, 6)\}$

(b) $\{(0, 0), (3, -5), (-2, -6), (6, 2)\}$

34. The time (in seconds) that it takes for an object to hit the ground is given by $f(d) = \frac{1}{4}\sqrt{d}$, where d is the distance (in feet) dropped.

If the object is dropped from 64 feet, how long does it take?

35. The time (in seconds) that it takes for an object to hit the ground is given by $f(d) = \frac{1}{4}\sqrt{d}$.

If the object is dropped from 25 feet, how long does it take?

36. Let $D(t)$ be your distance (in miles) from BCC t hours after noon on January 1, 2025. Explain the meaning of each statement:

(a) $D(3) = 10$

(b) $D(1) = 0$

(c) $D(0) = 2$
