

Name: _____

Algebra 2/Trigonometry
Review 8



1. Define the following terms:

a. Arithmetic sequence

A set of numbers in which the common difference between each term and the preceding term is constant.

b. Common difference

The difference between and two successive terms of an arithmetic sequence.

c. Explicit formula

For a sequence $a_1, a_2, a_3, \dots, a_n, \dots$, a formula used to generate the n^{th} term of a sequence. _____

d. Recursive rule

For a sequence $a_1, a_2, a_3, \dots, a_n, \dots$, a formula that requires the computation of all previous terms in order to find the value of a_n . _____

e. Geometric sequence

A set of terms in which each term is formed by multiplying the preceding term by a nonzero constant. _____

f. Common ratio

_The ratio of any two successive terms of a geometric sequence.

g. Base of an exponential function

The number b in the exponential function $y = ab^x$, where $a \neq 0, b > 0$, and $b \neq 1$ _____

h. Domain

The set of values of the independent variable for which a given function is defined _____

i. Range

The set of values of the dependent variable of a given function

j. **Function**

A rule that assigns to each number x in the function's domain a unique number

2. Write a recursive rule for the sequence 7,10,13,16,19,...

$$a_1 = 7, a_n = a_{n-1} + 3, n \geq 2$$

3. Find the sum of the first 20 terms of the series generated by the sequence in #2.

$$710$$

4. Write the first 5 terms of the sequence $a_n = 18 + 2(n-1)$.

$$\text{--- } 18, 20, 22, 24, 26 \text{ ---}$$

5. Write an explicit formula for the n^{th} term of the sequence $\frac{1}{3}, \frac{1}{9}, \frac{1}{27}, \frac{1}{81}, \dots$

$$a_n = \frac{1}{3} \left(\frac{1}{3} \right)^{n-1}$$

6. Find the sum of the first 30 terms of the series generated by the sequence in #5.

$$\frac{1}{2}$$

7. Find the 25^{th} term of the sequence 1, -2, 4, -8, 16, ...

$$16777216$$

8. What is the common difference of the sequence 25, 23, 21, 19, ...

$$\text{--- } d = -2 \text{ ---}$$

9. Is the sequence $4, 1, \frac{1}{4}, \frac{1}{16}, \dots$ arithmetic or geometric?

----geometric----

10. What is the common ratio of the sequence $6, 1, \frac{1}{6}, \frac{1}{36}, \dots$

$$\text{--- } r = \frac{1}{6} \text{ ---}$$

11. How do you tell whether a sequence is arithmetic or geometric?

---If there is a common difference it is arithmetic, if there is a common ratio it is geometric. -----

12. Find $\sec 35^\circ$ to the nearest hundredth.

___ 1.22 ___

13. Find $\csc 175^\circ$ to the nearest hundredth.

___ 11.47 ___

14. Find $\cot 156^\circ$ to the nearest hundredth.

___ -2.25 ___

15. Find $\tan \frac{2\pi}{3}$ in simplest radical form if an angle of $\frac{2\pi}{3}$ radians meets the unit circle at the point $\left(-\frac{1}{2}, \frac{\sqrt{3}}{2}\right)$.

___ $-\sqrt{3}$ ___

16. Find the inverse of the function $y = 3x - 12$.

___ $y = \frac{1}{3}x + 4$ ___

17. Find the inverse of the function $y = \frac{1}{4}x + 2$.

___ $y = 4x - 8$ ___

18. Solve: $|2x + 3| = 11$

___ $x = 4, x = -7$ ___

19. Solve: $|2x - 5| = 7$

___ $x = 6, x = -1$ ___

20. Solve: $-|3x - 8| = x - 1$

21. Solve: $|4x - 12| \leq 20$

__no solution__

22. Solve: $|x + 6| > 9$

{x: 2 \le x \le 8}

23. Solve: $-|x + 9| \geq -10$

{x: x < -15 or x > 3}

24. Solve: $x^2 - 4x + 8 \leq -4$

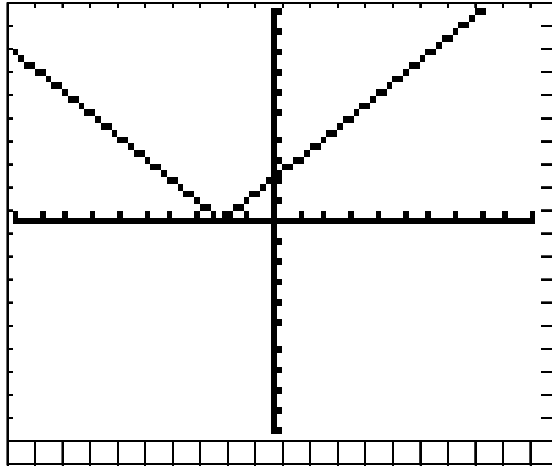
{x: -19 \le x \le 1}

25. Solve: $-x^2 - 3x - 2 > 0$

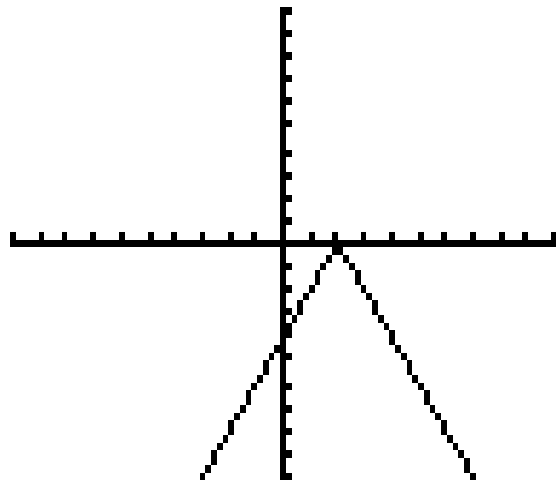
{x: x \le 2 or x \ge 6}

$$\{x: -2 < x < 1\}$$

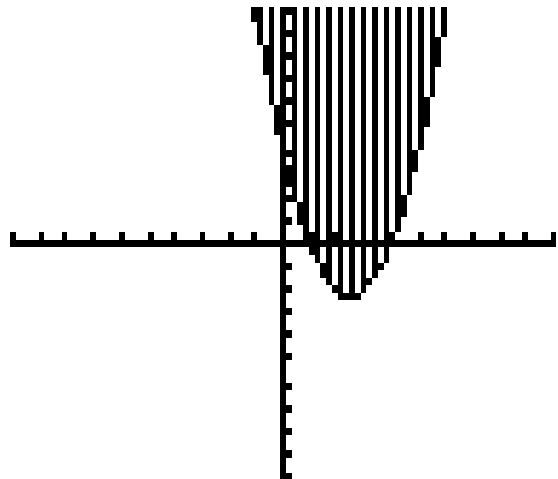
26. Graph: $y = |x+2|$



27. Graph: $y = -|2x-4|$



28. Graph: $y > x^2 - 5x + 4$



29. Solve for x : $\sqrt{x+11}+1=x$

----- $x=5$ -----

30. Solve for x : $7^{2x-1}=7^{3x-4}$

----- $x=3$ -----

31. Solve for x : $8^{x+1}=4^{2x}$

----- $x=3$ -----

32. Solve for x : $2^{3x+3}=8^{2x}$

----- $x=1$ -----

33. Solve for a : $\frac{1}{64}=16^a$

----- $a=-\frac{3}{2}$ -----

34. In which quadrants does the graph of $y=10^x$ lie?

--- I and II ---

35. Which point do all basic exponential functions have in common?

--- (0,1) ---

36. Factor completely: $x^4 - 16$

$(x+2)(x-2)(x^2+4)$

37. Find the product: $\frac{a+3}{9-a^2} \cdot \frac{a^2+a-12}{a+4}$

-1

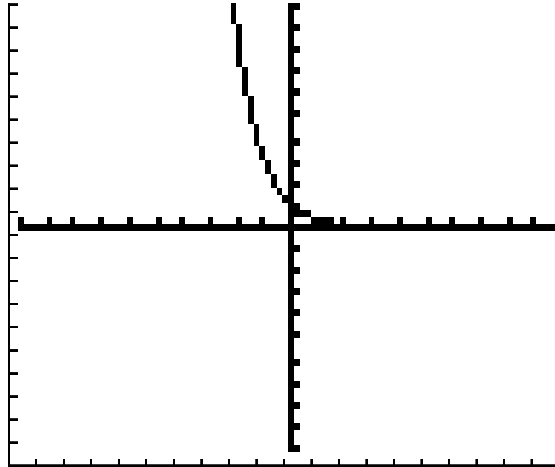
38. Simplify: $3^5 \cdot 3^x \cdot 3^y$

--- 3^{5+x+y} ---

39. Simplify and write with all positive exponents: $\frac{8x^{-2}y^{-5}z^2}{10x^3y^2z^{-4}}$

----- $\frac{4z^6}{5x^5y^7}$ -----

40. Graph $y = \left(\frac{1}{3}\right)^x$.

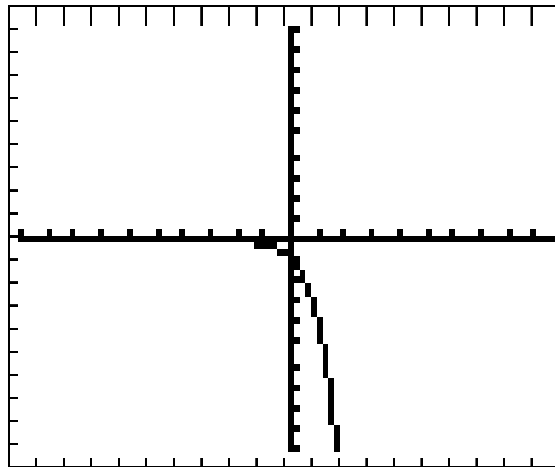


41. What are the domain and range of the function graphed in #40?

Domain: All real numbers

Range: {y : y > 0}

42. Graph $y = -(4)^x$.

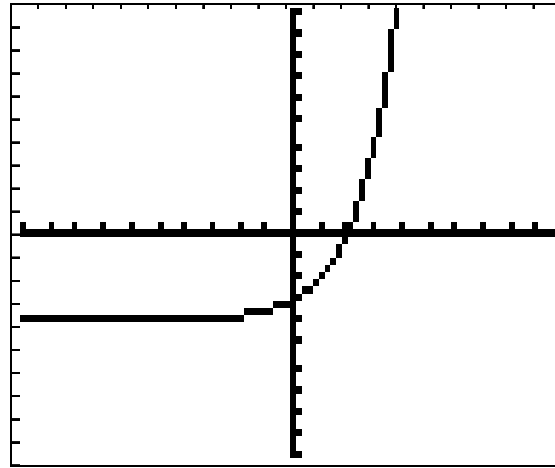


43. What are the domain and range of the function graphed in #42?

Domain: All Real Numbers

Range: {y : y < 0}

44. Graph $y = 2^x - 4$.



45. What are the domain and of the function graphed in #44?

range

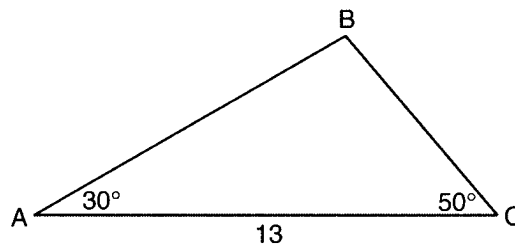
Domain: All Real Numbers_____

Range: $\{y : y > -4\}$ _____

46. If a central angle of $\frac{3\pi}{5}$ radians meets an arc of 35cm , what is the length of the radius of the circle to the nearest tenth centimeter?

$r = 18.6\text{cm}$

47. In the accompanying diagram of triangle ABC , $m\angle A = 30$, $m\angle C = 50$, and $AC = 13$.



What is the length of side \overline{AB} to the nearest tenth?

(1) 6.6

(2) 10.1

(3) 11.5

(4) 12.0

-----2-----

48. Two sides of a triangular-shaped pool measure 16 feet and 21 feet, and the included angle measures 58° . What is the area, to the nearest tenth of a square foot, of a nylon cover that would exactly fit the surface of the pool?

142.5 ft^2

49. Carmen and Jamal are standing 5280 feet apart on a straight, horizontal road. They observe a hot-air balloon between them directly above the road. The angle of elevation from Carmen is 60° and from Jamal is 75° . Draw a diagram to illustrate this situation and find the height of the balloon to the nearest foot.

---6246'---

50. In triangle ABC , $m\angle A = 33$, $a = 12$, and $b = 15$. What is $m\angle B$ to the nearest degree?

(1) 41

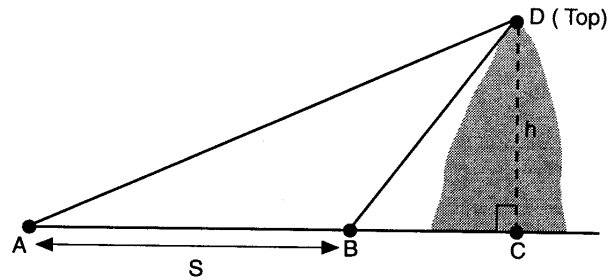
(2) 43

(3) 44

(4) 48

---2---

51. A ship at sea heads directly toward a cliff on the shoreline. The accompanying diagram shows the top of the cliff, D , sighted from two locations, A and B , separated by distance S . If $m\angle DAC = 30^\circ$, $m\angle DBC = 45^\circ$, and $S = 30$ feet, what is the height of the cliff, to the nearest foot?



-----41'-----