

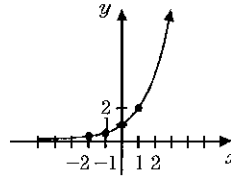
Exam Review Problem Set

Name: \_\_\_\_\_

Date: \_\_\_\_\_

1. Which is the equation of the graph below?

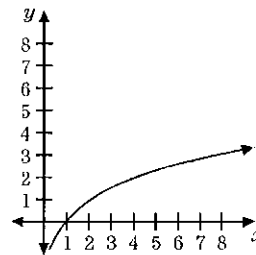
- A.  $y = \log_2 x$                       B.  $y = -\log_2 x$   
 C.  $y = 2^x$                               D.  $y = 2^{-x}$



1. \_\_\_\_\_

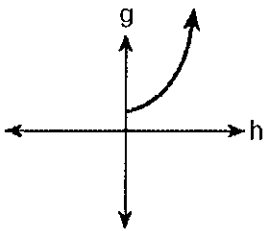
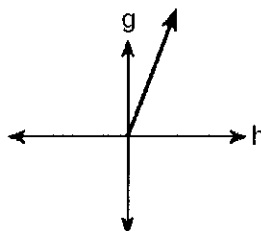
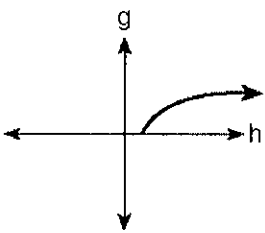
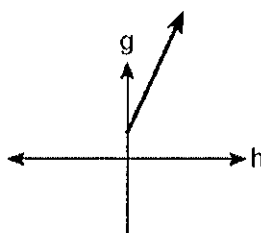
2. Which equation is represented by the graph in the accompanying diagram?

- A.  $y = \log x$                               B.  $y = \log_2 x$   
 C.  $y = 2^x$                                   D.  $y = 10^x$



2. \_\_\_\_\_

3. The cells of a particular organism increase logarithmically. If  $g$  represents cell growth and  $h$  represents time, in hours, which graph best represents the growth pattern of the cells of this organism?

- A. 
- B. 
- C. 
- D. 

3. \_\_\_\_\_

4. Which equation models the data in the accompanying table?

Time in hours, $x$	0	1	2	3	4	5	6
Population, $y$	5	10	20	40	80	160	320

- A.  $y = 2x + 5$                       B.  $y = 2^x$                               C.  $y = 2x$                               D.  $y = 5(2^x)$

4. \_\_\_\_\_

5. The height,  $f(x)$ , of a bouncing ball after  $x$  bounces is represented by  $f(x) = 80(0.5)^x$ . How many times higher is the first bounce than the fourth bounce? 5. \_\_\_\_\_
- A. 8                      B. 2                      C. 16                      D. 4
6. Given the equation  $x^2 - 8x + 15 = 0$ . Which statement is true? 6. \_\_\_\_\_
- A. The sum of the roots is 15.  
 B. Both roots are greater than zero.  
 C. One root is less than zero and the other root is greater than zero.  
 D. One root is zero and the other root is greater than zero.
7. Which quadratic equation has roots of  $(1 + 3i)$  and  $(1 - 3i)$ ? 7. \_\_\_\_\_
- A.  $x^2 + 2x - 10 = 0$                       B.  $x^2 - 2x + 10 = 0$   
 C.  $x^2 + 2x - 8 = 0$                       D.  $x^2 - 2x - 8 = 0$
8. In the equation  $ax^2 + bx + c = 0$ ,  $a$ ,  $b$ , and  $c$  are real numbers. If  $\frac{1}{3} - \frac{2}{3}i$  is a root of this equation, the sum of the roots is 8. \_\_\_\_\_
- A. 1                      B.  $-\frac{2}{3}$                       C.  $\frac{2}{3}$                       D. 0
9. What is the solution set of the equation  $x^2 + 9 = 0$ ? 9. \_\_\_\_\_
- A.  $\{3, -3\}$                       B.  $\{3i, -3i\}$                       C.  $\{-3, -3i\}$                       D.  $\{\}$
10. A radioactive substance has an initial mass of 100 grams and its mass halves every 4 years. Which expression shows the number of grams remaining after  $t$  years? 10. \_\_\_\_\_
- A.  $100(4)^{\frac{t}{4}}$                       B.  $100(4)^{-2t}$                       C.  $100(\frac{1}{2})^{\frac{t}{4}}$                       D.  $100(\frac{1}{2})^{4t}$

11. As shown in the table below, a person's target heart rate during exercise changes as the person gets older. 11. \_\_\_\_\_

Age (years)	Target Heart Rate (beats per minute)
20	135
25	132
30	129
35	125
40	122
45	119
50	115

Which value represents the linear correlation coefficient, rounded to the *nearest thousandth*, between a person's age, in years, and that person's target heart rate, in beats per minute?

- A. -0.999      B. -0.664      C. 0.998      D. 1.503
12. Determine the value of  $x$  and  $y$  if  $2^y = 8^x$  and  $3^y = 3^{x+4}$ . 12. \_\_\_\_\_
- A.  $x = 6, y = 2$       B.  $x = -2, y = -6$       C.  $x = 2, y = 6$       D.  $x = y$

13. The expression  $\frac{(b^{2n+1})^3}{b^n \cdot b^{4n+3}}$  is equivalent to 13. \_\_\_\_\_
- A.  $\frac{b^n}{2}$       B.  $b^n$       C.  $b^{-3n}$       D.  $b^{-3n+1}$

14. A population of rabbits doubles every 60 days according to the formula  $P = 10(2)^{\frac{t}{60}}$ , where  $P$  is the population of rabbits on day  $t$ . What is the value of  $t$  when the population is 320? 14. \_\_\_\_\_
- A. 240      B. 300      C. 660      D. 960

15. The expression  $N = \frac{\sqrt[4]{x^2y}}{z}$  is equivalent to 15. \_\_\_\_\_
- A.  $\log N = \frac{1}{4}(2 \log x + \log y - \log z)$       B.  $\log N = \frac{1}{4}(2 \log x + \log y) - \log z$
- C.  $\log N = \frac{1}{4} \log 2x + \frac{1}{4} \log y - \log z$       D.  $\log N = \frac{2}{4} \log x + \frac{1}{4} \log(y - z)$

16. Which statement about the graph of the equation  $y = e^x$  is *not* true?

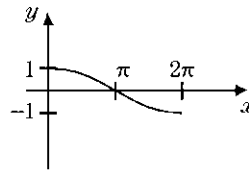
16. \_\_\_\_\_

- A. It is asymptotic to the  $x$ -axis.
- B. The domain is the set of all real numbers.
- C. It lies in Quadrants I and II.
- D. It passes through the point  $(e, 1)$ .

17. Which is an equation of the graph shown below?

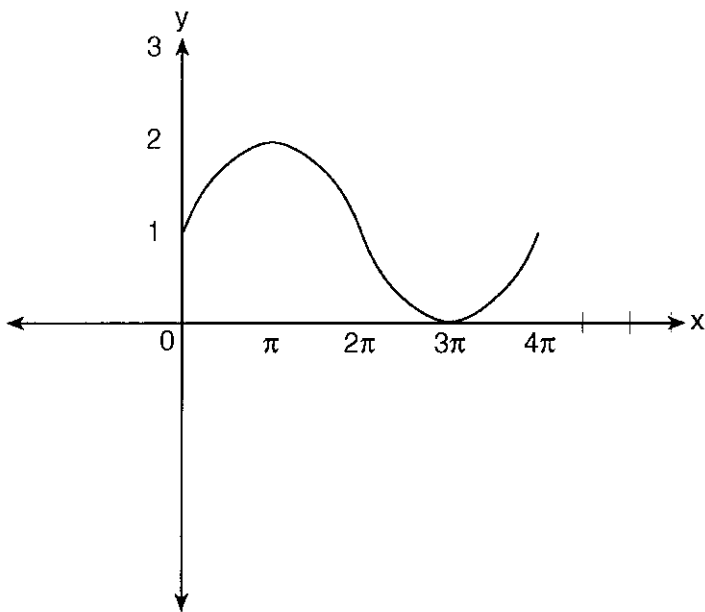
17. \_\_\_\_\_

- A.  $y = \cos \frac{1}{2}x$
- B.  $y = \cos 2x$
- C.  $y = \sin \frac{1}{2}x$
- D.  $y = \sin 2x$



18. In physics class, Eva noticed the pattern shown in the accompanying diagram on an oscilloscope.

18. \_\_\_\_\_

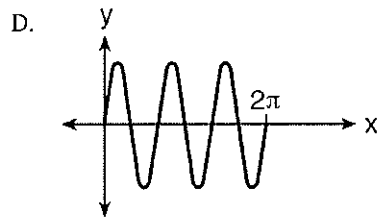
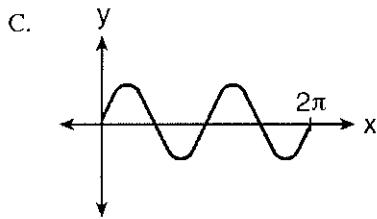
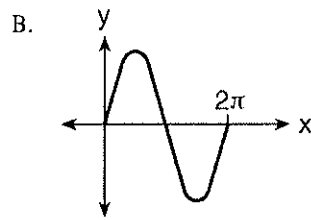
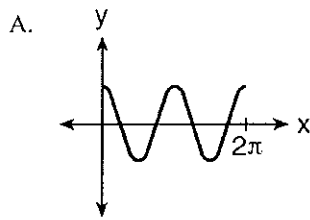


Which equation best represents the pattern shown on this oscilloscope?

- A.  $y = \sin(\frac{1}{2}x) + 1$
- B.  $y = \sin x + 1$
- C.  $y = 2 \sin x + 1$
- D.  $y = 2 \sin(-\frac{1}{2}x) + 1$

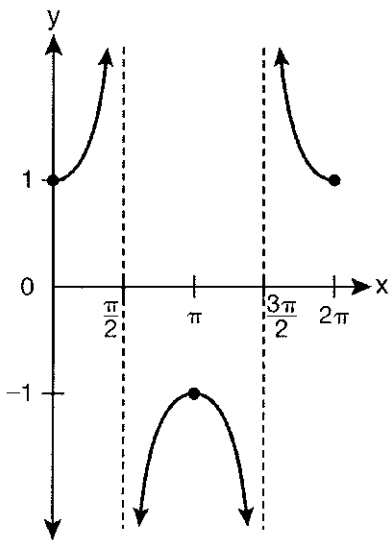
19. Which graph represents a sound wave that follows a curve whose period is  $\pi$  and that is in the form  $y = a \sin bx$ ?

19. \_\_\_\_\_



20. Which equation is represented by the graph below?

20. \_\_\_\_\_



A.  $y = \cot x$

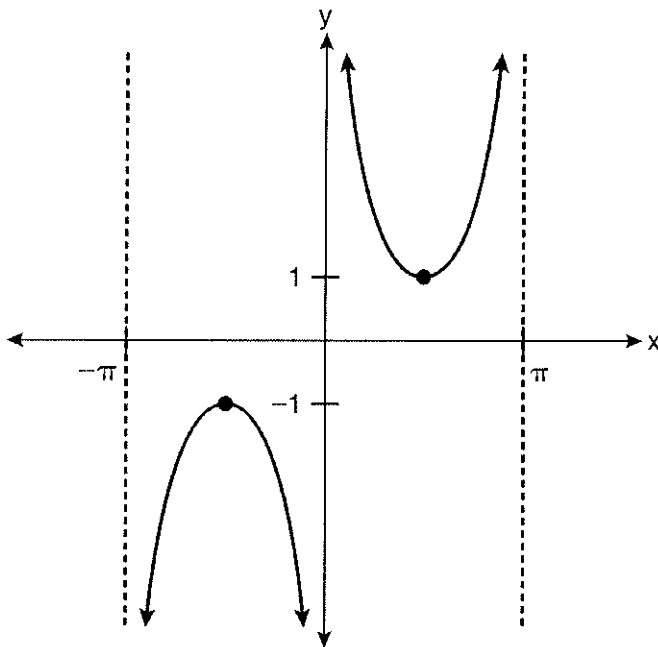
B.  $y = \csc x$

C.  $y = \sec x$

D.  $y = \tan x$

21. Which equation is sketched in the diagram below?

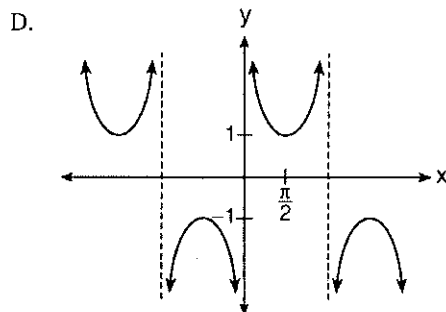
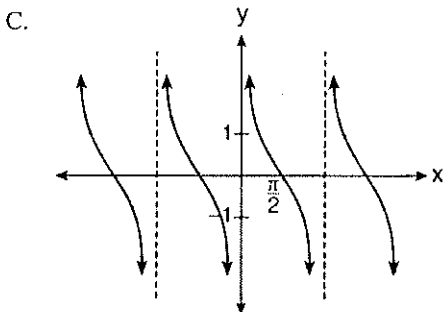
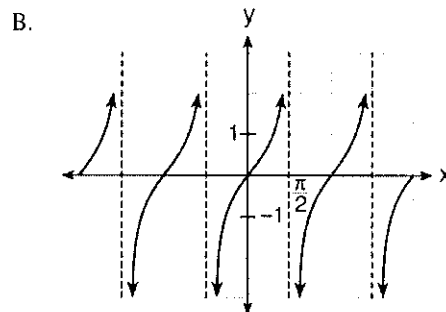
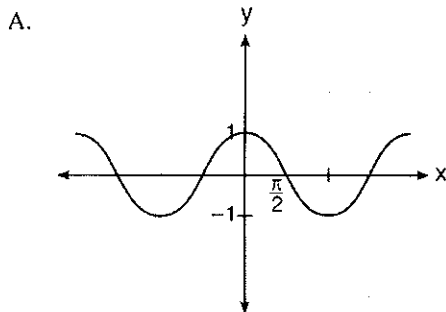
21. \_\_\_\_\_



- A.  $y = \csc x$       B.  $y = \sec x$       C.  $y = \cot x$       D.  $y = \tan x$

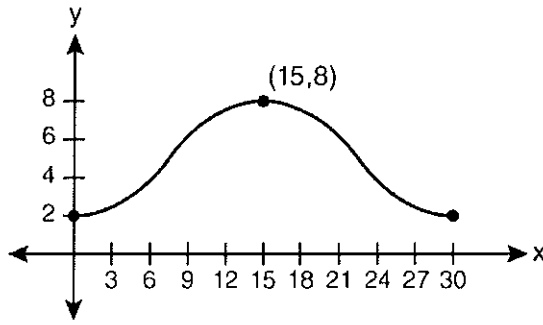
22. Which is a graph of  $y = \cot x$ ?

22. \_\_\_\_\_



23. Which equation is graphed in the diagram below?

23. \_\_\_\_\_



A.  $y = 3 \cos\left(\frac{\pi}{30}x\right) + 8$

B.  $y = 3 \cos\left(\frac{\pi}{15}x\right) + 5$

C.  $y = -3 \cos\left(\frac{\pi}{30}x\right) + 8$

D.  $y = -3 \cos\left(\frac{\pi}{15}x\right) + 5$

24. The value of  $2(\arcsin 1)$  is

24. \_\_\_\_\_

A. 0

B.  $\frac{1}{2}$

C.  $\pi$

D.  $\frac{\pi}{2}$

25. Find the value of  $\arcsin\left(\frac{1}{2}\right) + \arccos\left(\frac{\sqrt{2}}{2}\right)$ .

25. \_\_\_\_\_

26. What is a value of  $\arcsin\left(-\frac{\sqrt{2}}{2}\right)$

26. \_\_\_\_\_

A.  $\frac{\pi}{4}$

B.  $-\frac{\pi}{4}$

C.  $\frac{\pi}{2}$

D.  $-\frac{\pi}{2}$

27. If  $y = \sin(\arccos \frac{1}{2})$ , the value of  $y$  is

27. \_\_\_\_\_

A.  $\frac{1}{2}$

B.  $\frac{\sqrt{3}}{2}$

C.  $30^\circ$

D.  $60^\circ$

28. What is the value of  $\cos(\arctan \frac{\sqrt{7}}{3})$ ?

28. \_\_\_\_\_

A.  $\frac{3}{4}$

B.  $\frac{3}{16}$

C.  $\frac{3\sqrt{7}}{7}$

D.  $\frac{\sqrt{7}}{4}$

29. What is the value of  $\sin(\arccos \frac{1}{2})$ ?

29. \_\_\_\_\_

A. 1

B.  $\frac{1}{2}$

C.  $\frac{1}{2}\sqrt{3}$

D.  $\frac{1}{2}\sqrt{2}$

30. The ratio  $\frac{\arccos \frac{1}{2}}{\arctan 1}$  is equal to

A.  $\frac{3}{4}$

B.  $\frac{3\pi}{4}$

C.  $\frac{4}{3}$

D.  $\frac{4\pi}{3}$

30. \_\_\_\_\_