



6. Write an equation of the cosine function with amplitude 2 and period  $4\pi$ .

a.  $y = 2 \cos\left(\frac{1}{2}x\right)$

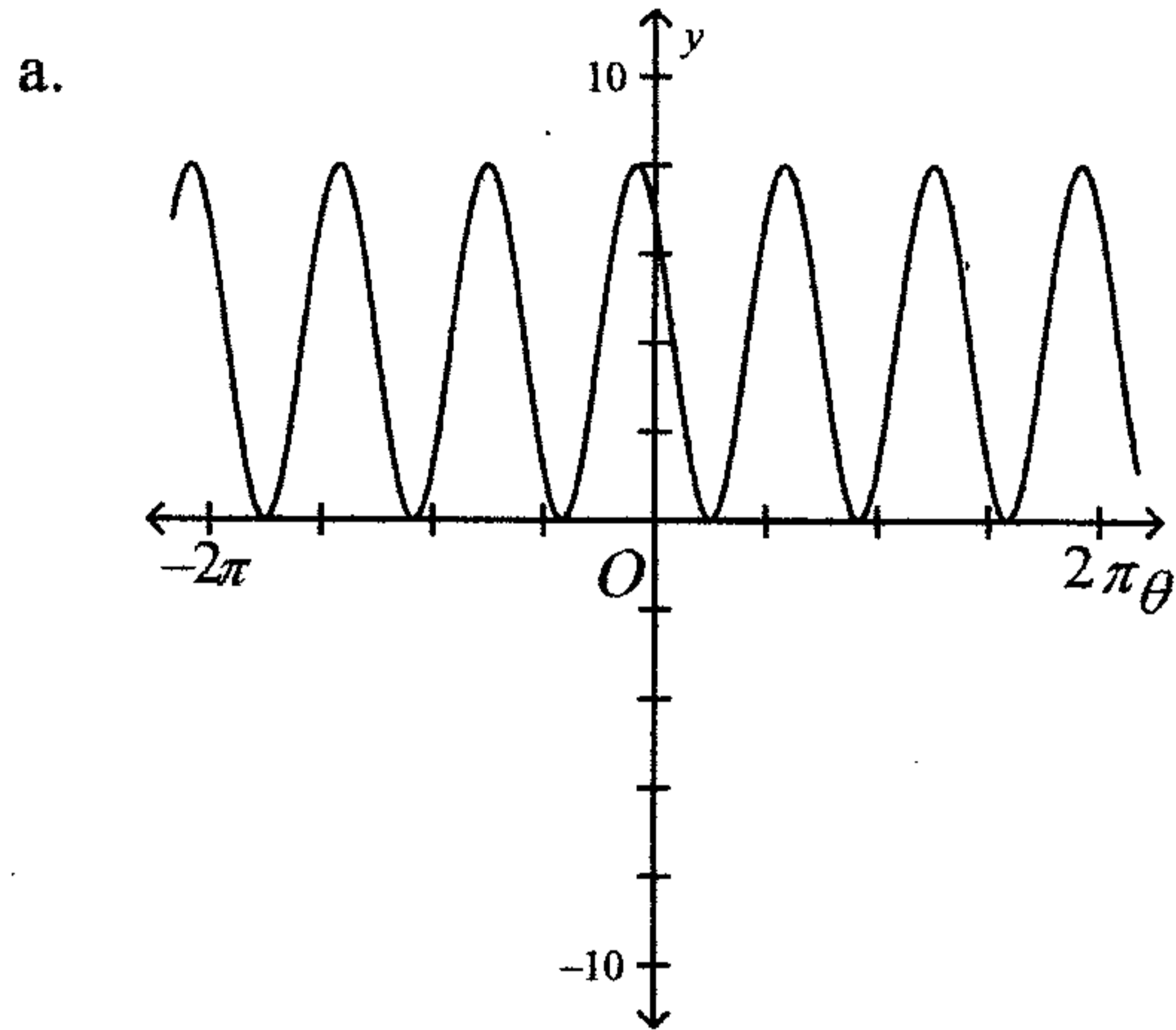
c.  $y = -\frac{1}{2} \cos\left(\frac{1}{2}x\right)$

b.  $y = -2 \cos\left(\frac{1}{4}x\right)$

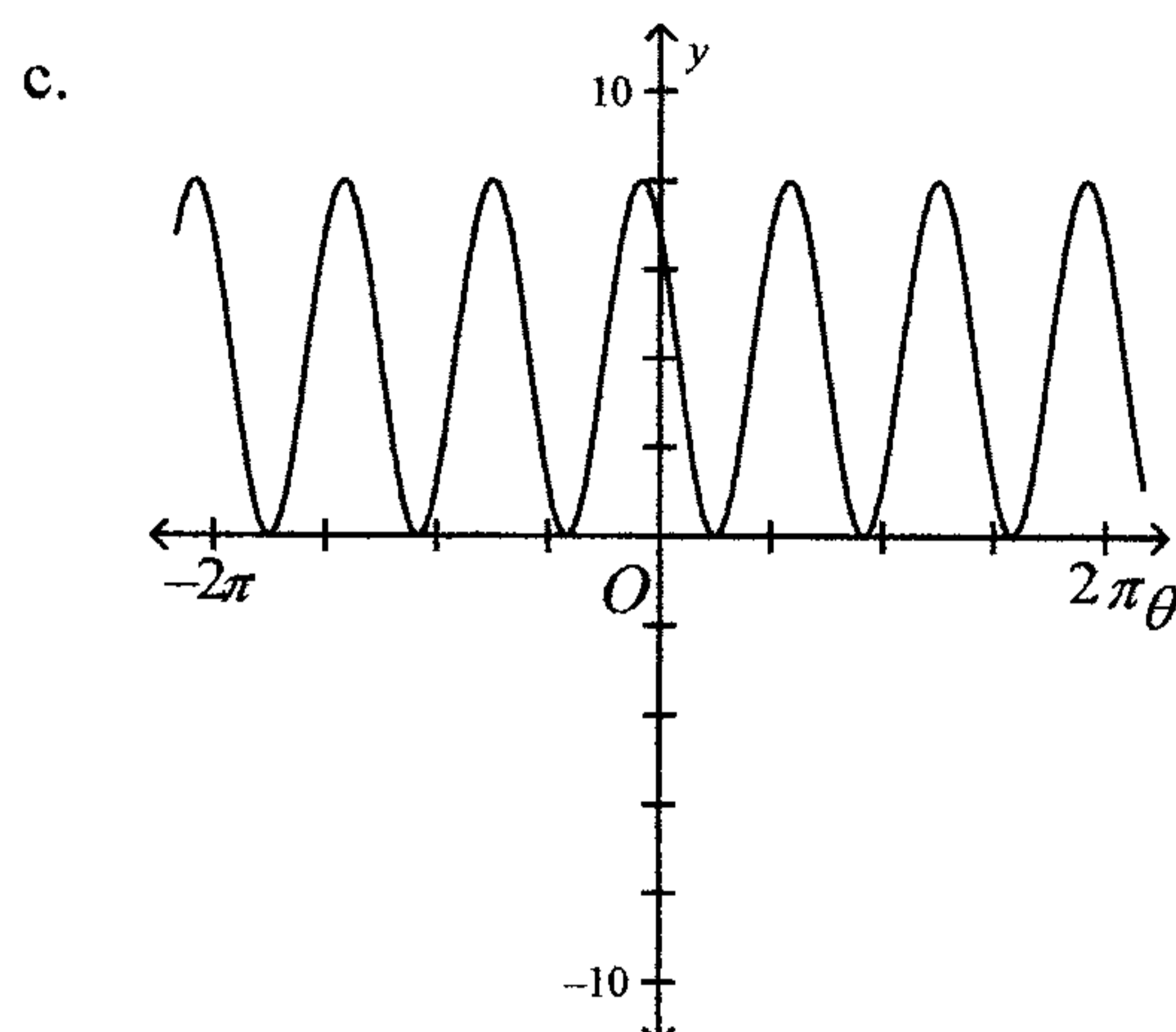
d.  $y = \frac{1}{2} \cos\left(\frac{1}{4}x\right)$

7. Graph the function. Which choice gives the amplitude, period, phase shift, and vertical shift for the function?

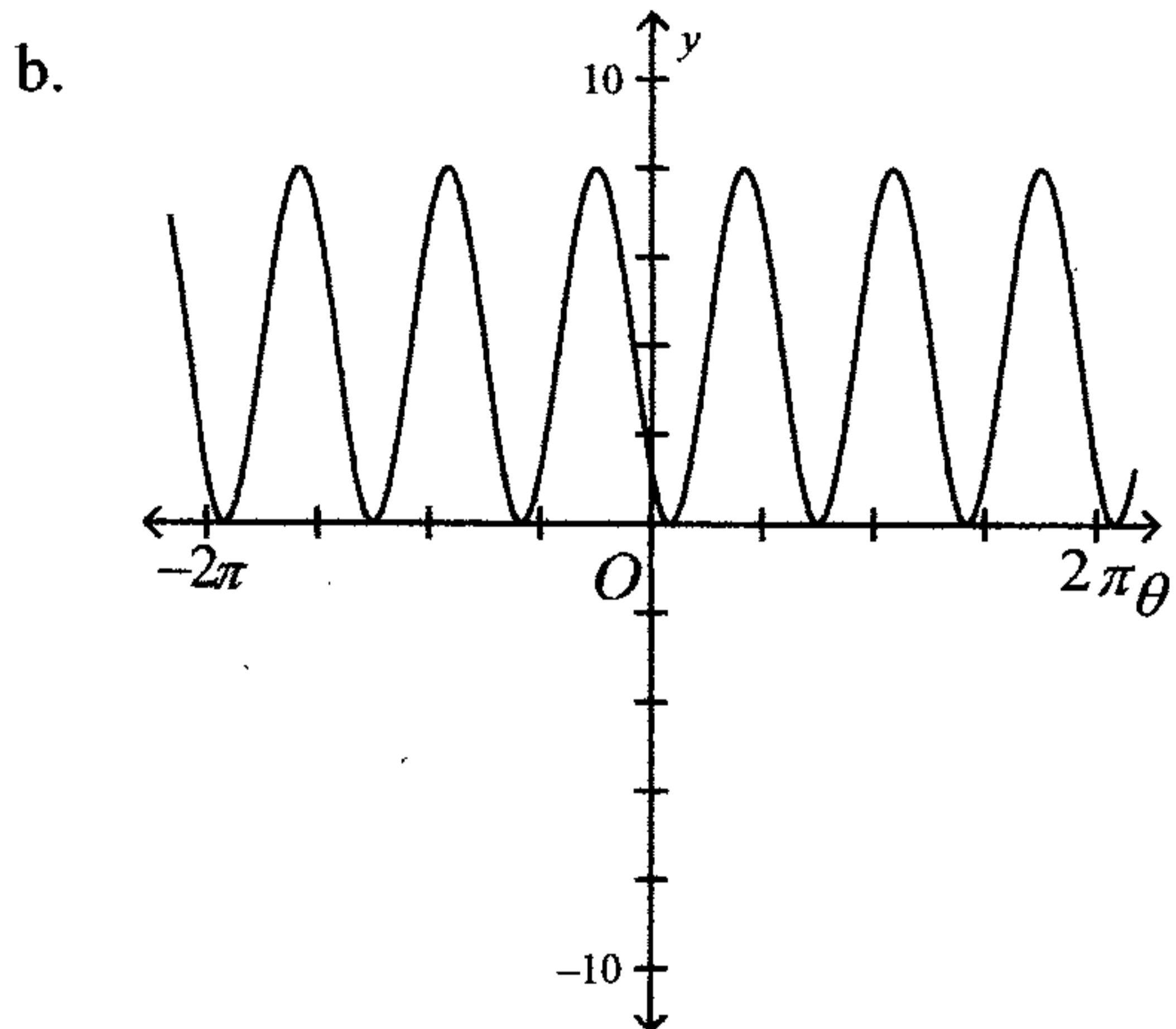
$$y = 4 \cos\left(3\theta + \frac{3}{4}\pi\right) + 4$$



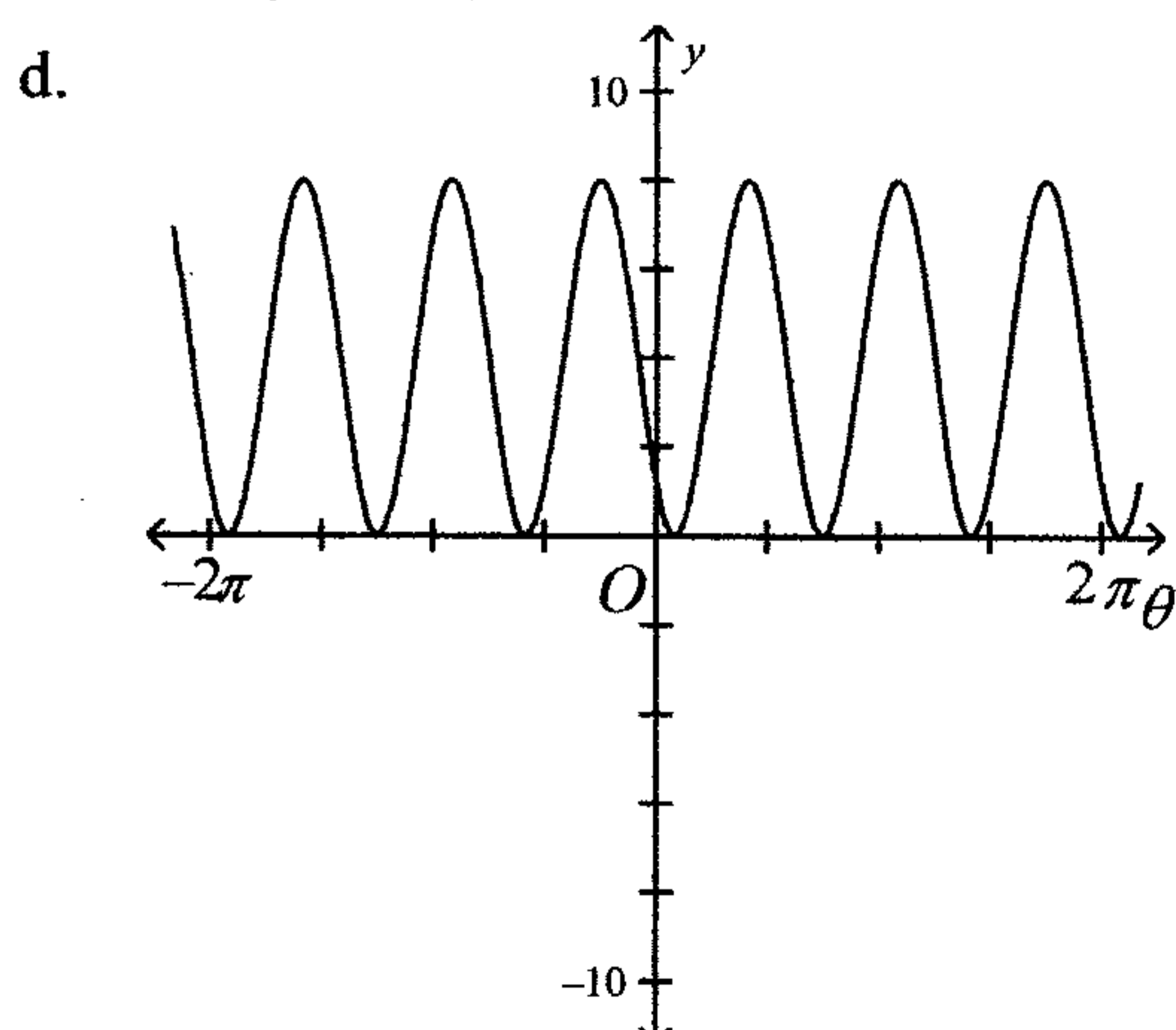
$4; \frac{2}{3}\pi; -\frac{1}{4}\pi; 4$



$-4; \frac{2}{3}\pi; -\frac{1}{4}\pi; 4$



$4; \frac{2}{3}\pi; -\frac{1}{4}\pi; 4$

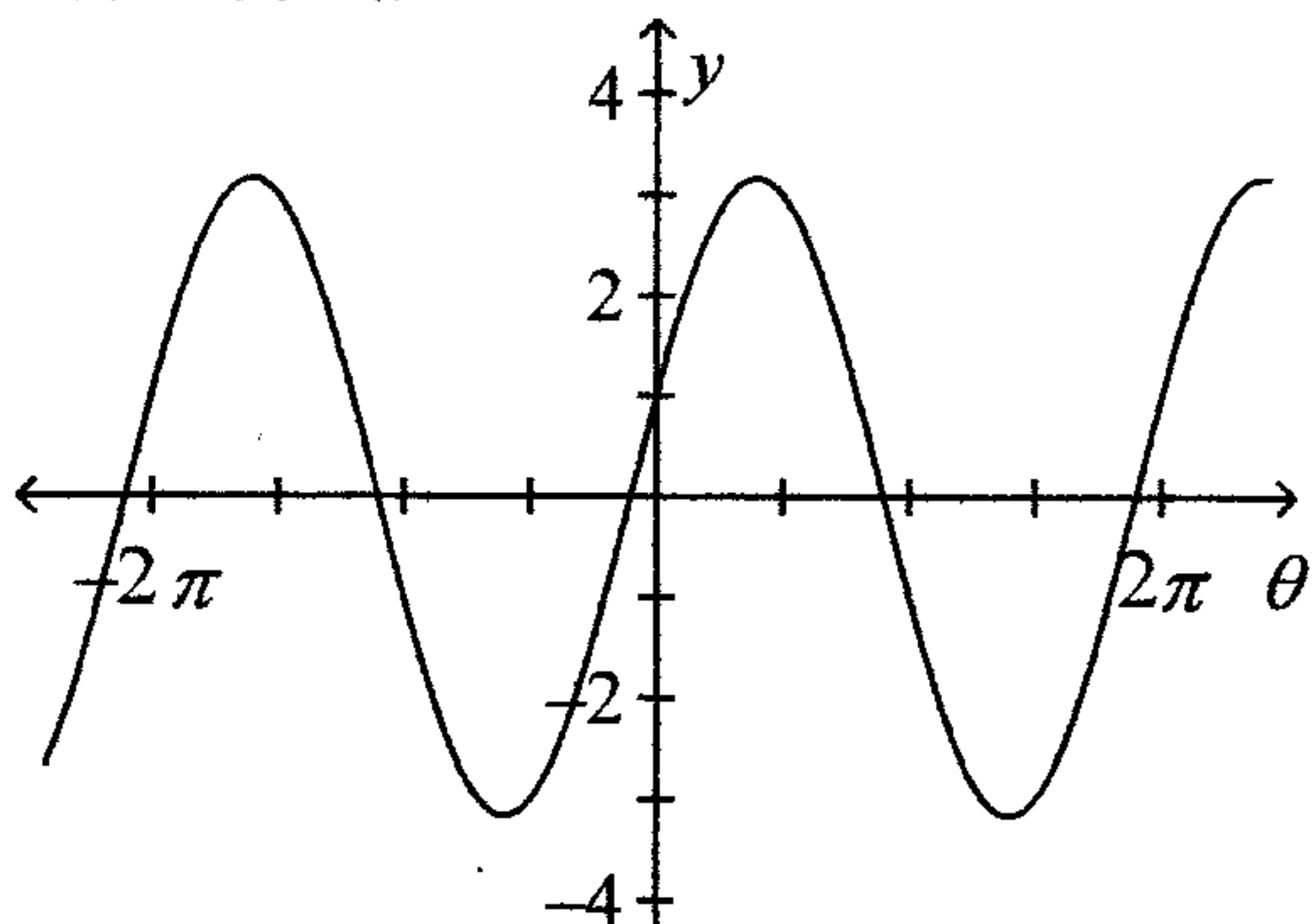


$-4; \frac{2}{3}\pi; -\frac{1}{4}\pi; -4$

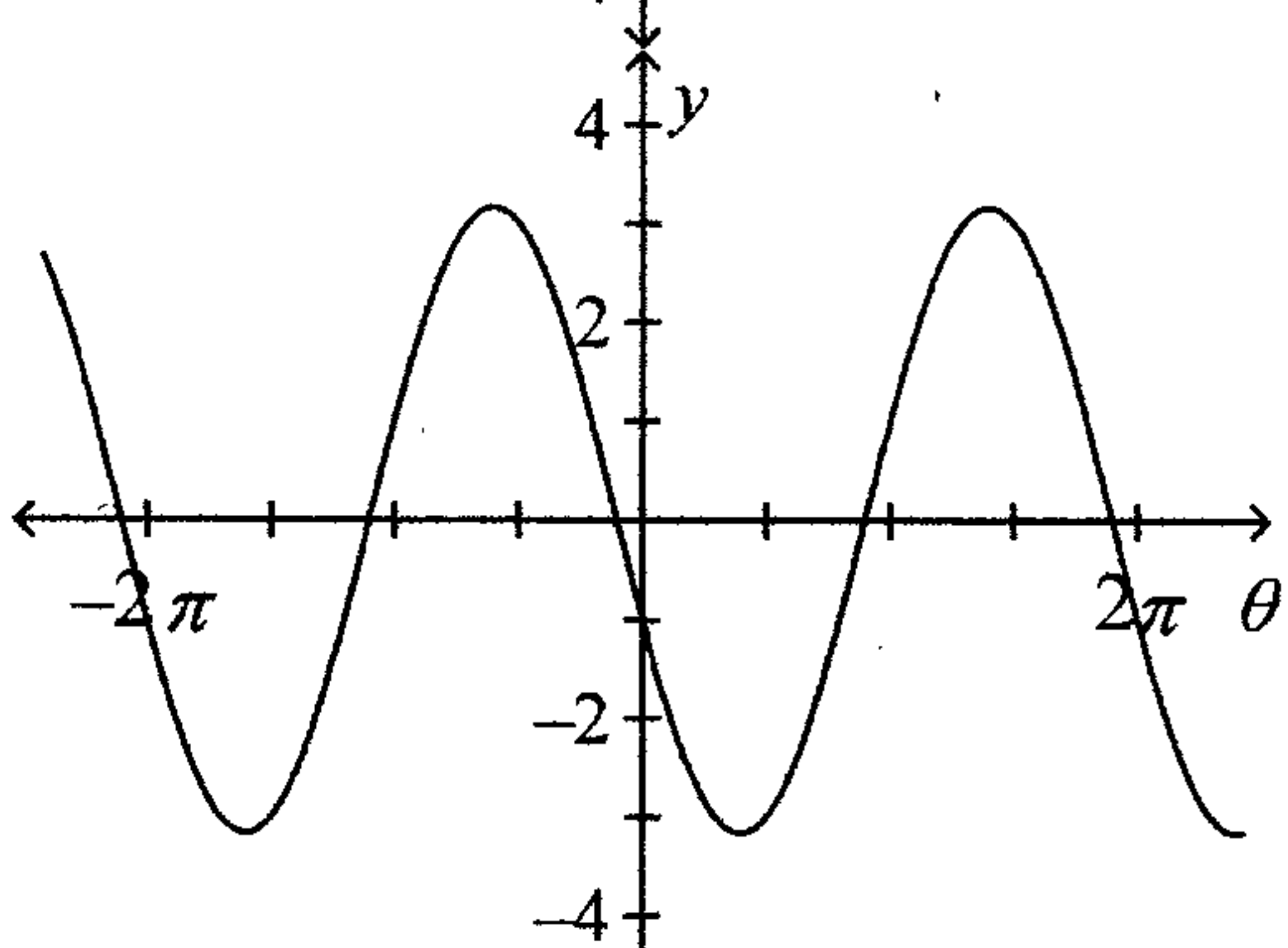
Graph the function.

8.  $y = \cos x - 3\sin x$

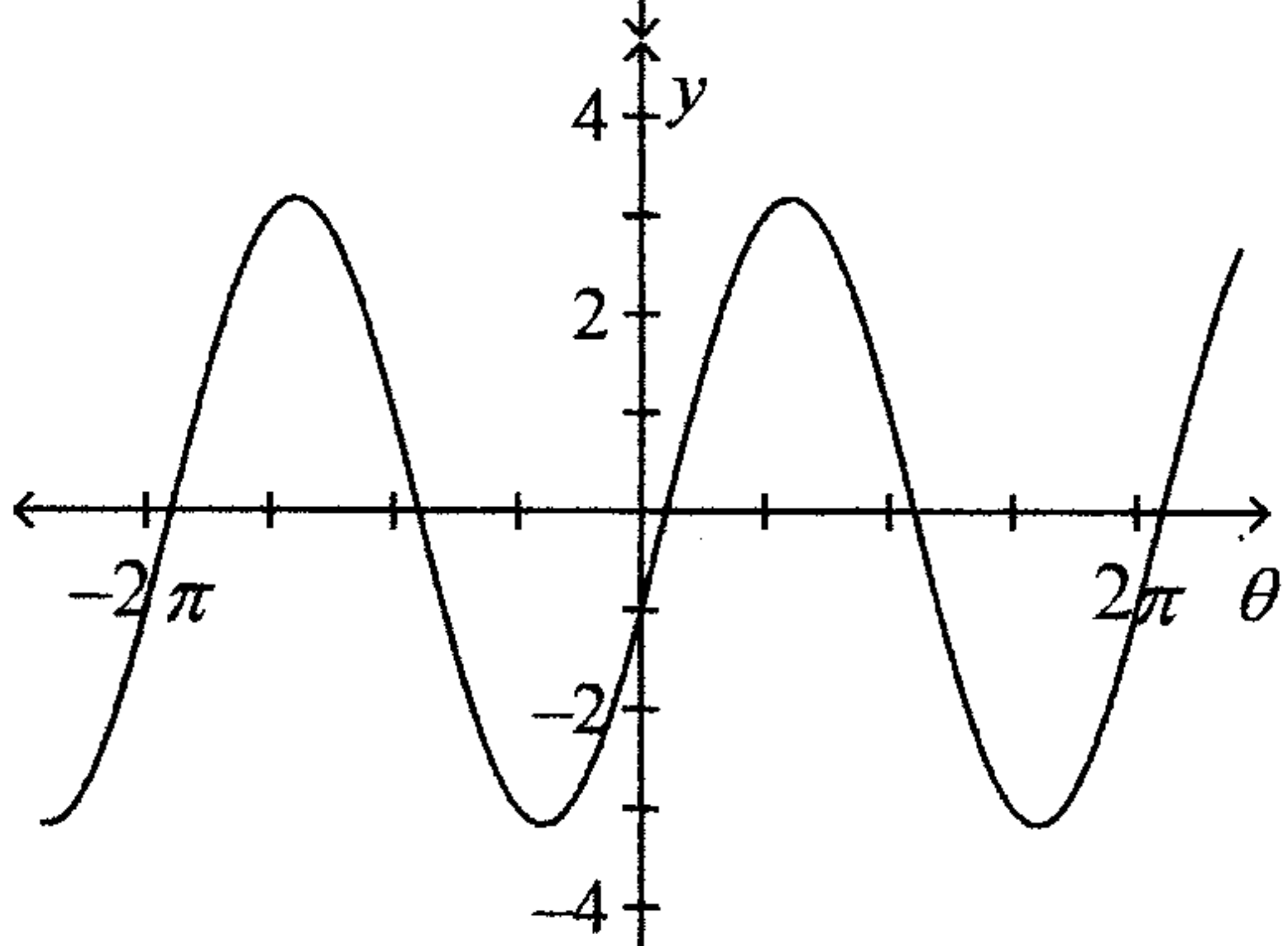
a.



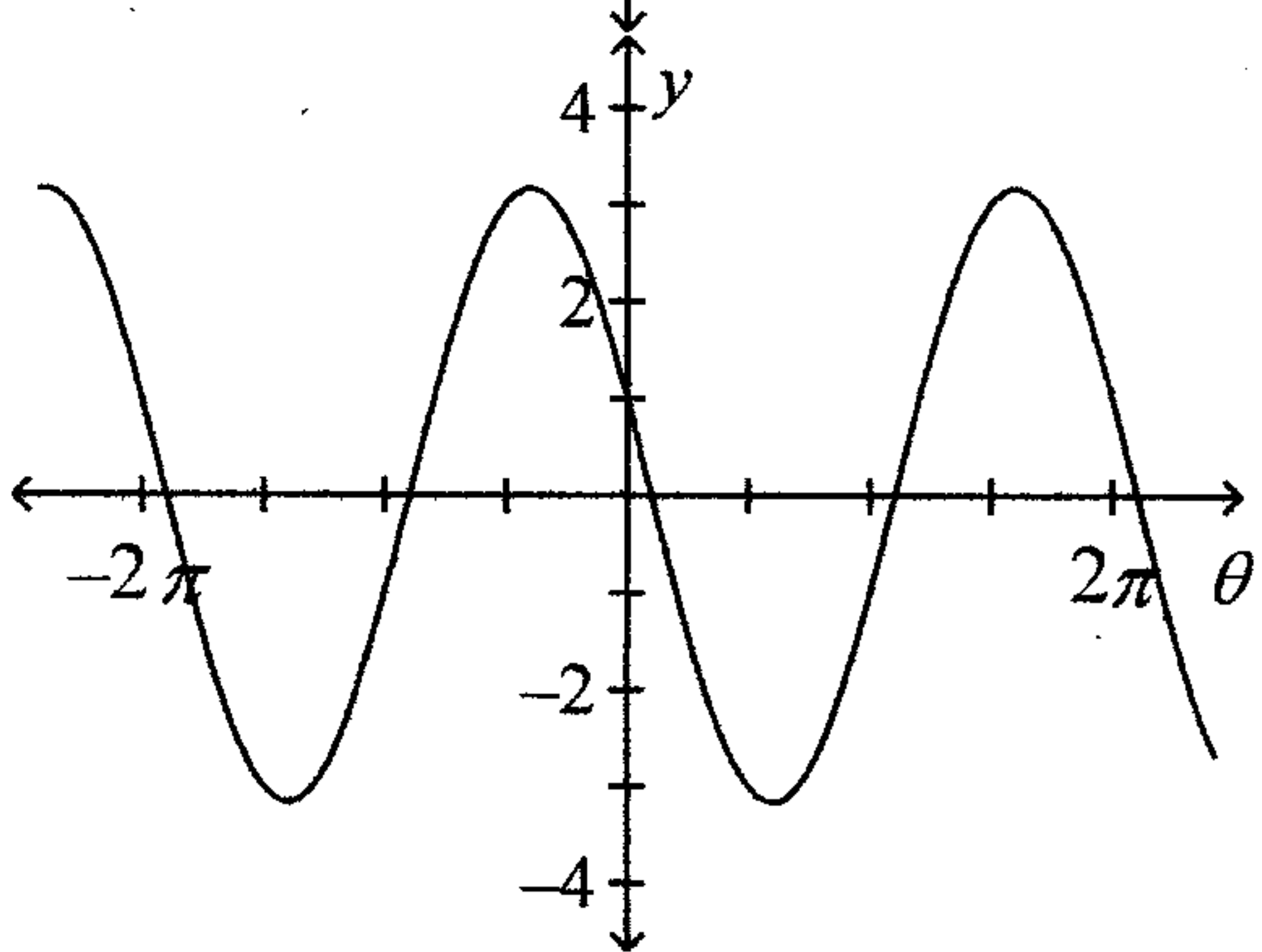
b.



c.



d.



9. What basic trigonometric identity would you use to verify that  $\cot x \sin x = \cos x$ ?

a.  $\cos^2 x + \sin^2 x = 1$

c.  $\cos x = \frac{1}{\sec x}$

b.  $\cot x = \frac{\cos x}{\sin x}$

d.  $\sin x = \frac{1}{\csc x}$

10. Find  $\cos x$  if  $\sin x \cot x = 4$ .

a. 4

b. 2

c. 1

d.  $\sqrt{2}$

11. Find  $\cos x$  if  $\frac{\sin^2 x - 1}{\cos x} = -1$ .

a. -1

b. 2

c. 1

d. 0

12. If  $\alpha$  and  $\beta$  are the measures of two first quadrant angles and  $\sin \alpha = \frac{4}{5}$  and  $\sin \beta = \frac{5}{13}$ , find  $\sin(\alpha + \beta)$ .

a.  $\frac{63}{65}$

b.  $\frac{33}{65}$

c.  $\frac{16}{65}$

d.  $\frac{56}{65}$

13. If  $\sin \theta = \frac{3}{5}$  and  $\theta$  terminates in the first quadrant, find the exact value of  $\cos 2\theta$ .

a.  $\frac{3}{5}$

b.  $\frac{9}{25}$

c.  $\frac{3}{10}$

d.  $\frac{7}{25}$

14. Solve  $5 \tan x = 5\sqrt{3}$  for  $0^\circ \leq x \leq 180^\circ$ .

a.  $60^\circ$

b.  $150^\circ$

c.  $30^\circ$

d.  $120^\circ$

15. Solve  $2 - 3 \cos x = 5 + 3 \cos x$  for  $0^\circ \leq x \leq 180^\circ$ .

a.  $150^\circ$

b.  $30^\circ$

c.  $60^\circ$

d.  $120^\circ$

16. Solve  $\tan x \sec x - 2 \tan x = 0$  for all real values of  $x$ .

a.  $0 + 2\pi k, \frac{2\pi}{3} + \pi k$

c.  $0 + \pi k, \frac{\pi}{2} + 2\pi k$

b.  $\frac{\pi}{3} + \pi k, \frac{2\pi}{3} + \pi k$

d.  $0 + \pi k, \frac{\pi}{3} + 2\pi k, \frac{5\pi}{3} + 2\pi k$

17. Simplify the expression  $(3x^4 y^{-5})^3$ .

a.  $\frac{27x^{12}}{y^{15}}$

c.  $\frac{y^{15}}{9x^4}$

b.  $\frac{y^{15}}{27x^{12}}$

d.  $\frac{9x^4}{y^{15}}$

- \_\_\_\_\_ 18. Evaluate  $\left(27^{-\frac{1}{3}}\right)^{\frac{3}{3}}$ .
- a. -3  
b. -27  
c. 3  
d. 27
- \_\_\_\_\_ 19. Evaluate the expression  $\log_3\left(\frac{1}{243}\right)$ .
- a. 5  
b.  $-\frac{1}{5}$   
c.  $\frac{1}{5}$   
d. -5
- \_\_\_\_\_ 20. Solve  $\log_2 x = 3$ .
- a.  $\sqrt[2]{2}$   
b.  $\sqrt{3}$   
c. 9  
d. 8
- \_\_\_\_\_ 21. Use a calculator to evaluate  $\log 0.72$ .
- a. -0.3285  
b. 0.1427  
c. -0.1427  
d. 0.3285
- \_\_\_\_\_ 22. Use a calculator to find  $\text{antilog } 3.36361$ .
- a. 1745  
b. 2310  
c. 2035  
d. 2335
- \_\_\_\_\_ 23. Find the sum of the first 21 terms of the sequence 5, 9, 13, 17, 21, ...
- a. 945  
b. 944  
c. 947  
d. 946
- \_\_\_\_\_ 24. Find the sum of the first 4 terms of the series.  
 $2 - 8 + 32 - 128 + \dots$
- a. -101  
b. -103  
c. -102  
d. -104
- \_\_\_\_\_ 25. Evaluate the limit, or state that the limit does not exist.  $\frac{4n - 6n}{10n}$
- a. Limit does not exist  
b.  $-\frac{1}{5}$   
c. 4  
d. 0

\_\_\_\_\_ 26. Find the sum of the geometric series.

$$14 - 7 + \frac{7}{2} - \frac{7}{4} + \dots$$

a.  $\frac{7007}{13}$

b.  $\frac{28}{3}$

c.  $\frac{5005}{7}$

d. 2002

\_\_\_\_\_ 27. Write  $\sum_{k=6}^{11} (2k + 5)$  in expanded form and find the sum.

a.  $17 + 19 + 21 + 23 + 25; 27$

b.  $17 + 19 + 21 + 23 + 25 + 27; 132$

c.  $17 + 19 + 21 + 23 + 25; 132$

d.  $19 + 21 + 23 + 25 + 27; 17$

\_\_\_\_\_ 28. Find the seventh term of the expansion of  $(3x + 7y)^{11}$ .

a.  $462 (3x)^4 (7y)^5$

b.  $330 (7x)^6 (3y)^5$

c.  $462 (3x)^5 (7y)^6$

d. none of these

29. Express the series  $5 + 9 + 13 + \dots + 101$  using sigma notation.

A.  $\sum_{k=1}^{\infty}(4k + 1)$    B.  $\sum_{k=1}^{25}(4k + 1)$    C.  $\sum_{k=1}^{25}(4k - 1)$    D.  $\sum_{k=1}^{24}(4k + 1)$

30. The expression  $32x^5 + 80x^4 + 40x^3 + 40x^2 + 10x + 1$  is the expansion of which binomial?

A.  $(2x + 1)^5$    B.  $(x + 2)^5$    C.  $(2x + 2)^5$    D.  $(2x - 1)^5$

31. Find the fourth term in the expansion of  $(3x - y)^7$ .

A.  $-105x^4y^3$    B.  $420x^4y^3$    C.  $1701x^4y^3$    D.  $-2835x^4y^3$

32. A car is bought for \$25,000. The interest rate is 6.4% and the loan will be for 5 years. What would the monthly car payment be on this loan?

A. \$485.38   B. \$485.39   C. \$485.40   D. \$485.41

33. You want to buy a \$175,000 house. What is the difference in the monthly mortgage payment between a 15 year loan and a 30 year loan? Use an interest rate of 4.5%

A. \$472.01   B. \$472.02   C. \$472.03   D. \$472.04

34. Solve  $\sin 2x = 5(\sin x)$  for all values of  $x$ . Assume that  $K$  is any integer.

A.  $180^{\circ}k$    B.  $360^{\circ}k$    C.  $90^{\circ} + 180^{\circ}k$    D.  $90^{\circ} + 360^{\circ}k$

35. Simplify:  $\frac{\cot x}{\cos x} + \frac{1}{\sin x}$

A.  $2\cot^2 x$    B.  $2\csc x$    C.  $2\sin x$    D. No Solution

36. Which is an example of a natural logarithm?

A.  $\log 6$    B.  $\ln 6$    C. Both A and B   D. None of these

37. If  $\cos x = 0.8$  and  $270^{\circ} < x < 360^{\circ}$ , find the exact value of  $\cos 2x$ .

A.  $-.96$    B.  $-.28$    C.  $.96$    D.  $.28$