ARE YOU READY 4 CALCULUS

TEACHER NAME: _____
STUDENT NAME: _____
PERIOD: _____

50 Problems - Calculator allowed for some problems

SCORE SHEET

STUDENT NAME: _____

Problem	Answer	Problem	Answer
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Problem: 1

One solution of $x^3 - 5x^2 + 5x - 1 = 0$ is 1. Find the other two solutions.

A) $\{4 + \sqrt{3}, 4 - \sqrt{3}\}$ B) $\{2 + \sqrt{3}, 2 - \sqrt{3}\}$

C) $\{4 + 2\sqrt{3}, 4 - 2\sqrt{3}\}$ D) $\{2 + 2\sqrt{3}, 2 - 2\sqrt{3}\}$

Problem 2

A twenty-five foot ladder just reaches the top of a house and forms and 41.5 degrees with the wall of the house. How tall is the house? Round your answer to the nearest 0.1 foot.

A) 18.6 ft B) 19 ft C) 18.7 ft D) 18.8 ft

Problem: 3

What principal invested at 8%, compounded continuously for 4 years, will yield $1190? Round the answer to two decimal places.

A) $1188.62 B) $864.12 C) $627.48 D) $1638.78

Problem: 4

The logistic growth model $P(t) = \frac{1240}{1 + 30e^{-0.333t}}$ represents the population of a bacterium in a culture tube after t hours. What was the initial amount of bacteria in the population?

A) 45 B) 40 C) 39 D) 41

Problem: 5

If $\sin\theta = 0.3$, find $\sin(\theta + \pi)$.

A) −0.7 B) 0.3 C) −0.3 D) 0.7

Problem: 6

Find all the zeros of the function and write the polynomial as a product of linear factors.

$f(x) = x^3 - x^2 + 36x - 36$

A) $f(x) = (x - 1)(x + 1)(x + 36)$

B) $f(x) = (x - 1)(x + 6i)(x - 6i)$

C) $f(x) = (x - 1)(x + 6)(x - 6)$

D) $f(x) = (x - 25)(x + i)(x - i)$

Problem: 7

Information is given about a polynomial $f(x)$ whose coefficients are real numbers. Find the remaining zeros of f.

Degree 3; zeros: 2, 3 – i

A) 3 + i B) –3 + i C) –2 D) no other zeros

Problem: 8

Without graphing the function, determine its amplitude or period as requested.

$y = \sin 5x$ Find the period.

A) 2π B) 5 C) $\frac{2\pi}{5}$ D) 1

Problem: 9

Without graphing the function, determine its amplitude or period as requested.

$y = -4 \sin x$ Find the amplitude.

A) 2π B) 4 C) $\frac{\pi}{4}$ D) -4π

Problem: 10

Write as the sum and/or difference of logarithms. Express powers as factors.

$$\log_3\left(\frac{x-2}{x^8}\right)$$

A) $\log_3 (x-2) - \log_3 x$

B) $8\log_3 x - \log_3 (x-2)$

C) $\log_3 (x-2) + 8\log_3 x$

D) $\log_3 (x-2) - 8\log_3 x$

Problem: 11

Write as the sum and/or difference of logarithms. Express powers as factors.

$$\log_9 \frac{11}{4}$$

A) $\log_9 11 \div \log_9 4$

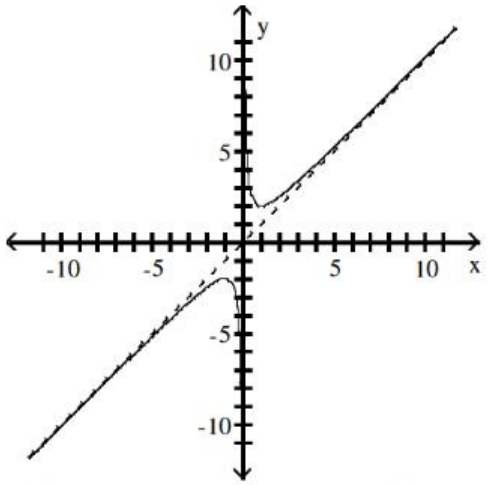
B) $\log_9 4 - \log_9 11$

C) $\log_9 11 - \log_9 4$

D) $\log_9 11 + \log_9 11$

Problem: 12

Use the graph to find the oblique asymptote, if any, of the function.



A) $y = -x$ B) $y = 2x$ C) $y = x$ D) none

Problem: 13

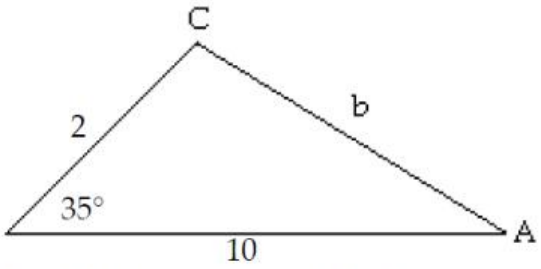
Find the exact solution of the equation.

$$\sin^{-1} x = \frac{\pi}{2}$$

A) $x = 1$ B) $x = -1$ C) $x = 0$ D) $x = \pi$

Problem: 14

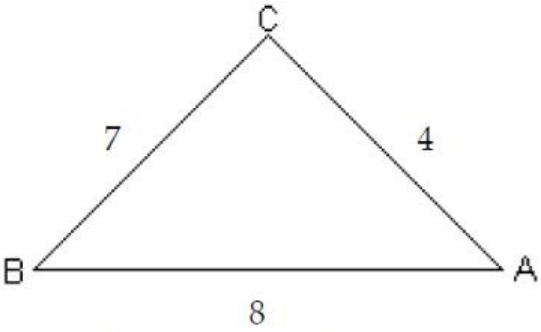
Solve the triangle.



A) b = 9.44, A = 7.8°, C = 137.2°
B) b = 7.44, A = 137.2°, C = 7.8°
C) b = 8.44, A = 137.2°, C = 7.8°
D) b = 8.44, A = 7.8°, C = 137.2°

Problem: 15

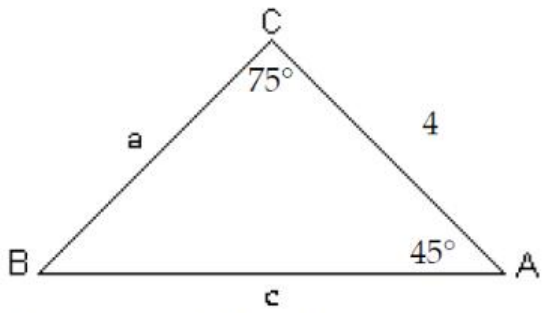
Solve the triangle.



A) A = 61°, B = 89°, C = 30°
B) A = 30°, B = 89°, C = 61°
C) A = 30°, B = 61°, C = 89°
D) A = 61°, B = 30°, C = 89°

Problem: 16

Solve the triangle.



A) B = 60°, a = 3.27, c = 4.46
B) B = 55°, a = 4.46, c = 3.27
C) B = 60°, a = 4.46, c = 3.27
D) B = 65°, a = 3.27, c = 4.46

Problem: 17

Find the vertical asymptotes of the rational function.

$$H(x) = \frac{x - 4}{16x - x^3}$$

A) x = 0, x = −4
B) x = −4, x = 4
C) x = 0, x = 4
D) x = 0, x = −4, x = 4

Problem: 18

Find the exact value of the expression.

$\sin\frac{\pi}{12}$

A) $-\sqrt{2}(\sqrt{3}-1)$ B) $\sqrt{2}(\sqrt{3}-1)$ C) $-\frac{\sqrt{2}(\sqrt{3}-1)}{4}$ D) $\frac{\sqrt{2}(\sqrt{3}-1)}{4}$

Problem: 19

Find the exact value of the expression.

$\sin^{-1}\frac{\sqrt{2}}{2}$

A) $\frac{3\pi}{4}$ B) $\frac{\pi}{4}$ C) $\frac{\pi}{3}$ D) $\frac{2\pi}{3}$

Problem: 20

Express the product as a sum containing only sines or cosines.

$\sin(6\theta)\sin(3\theta)$

A) $\frac{1}{2}[\cos(3\theta)-\cos(9\theta)]$ B) $\frac{1}{2}[\sin(9\theta)+\cos(3\theta)]$

C) $\sin^2(18\theta^2)$ D) $\frac{1}{2}[\cos(9\theta)-\cos(3\theta)]$

Problem: 21

Use the given zero to find the remaining zeros of the function.

$f(x) = x^3 + 3x^2 - 8x + 10$; zero: $1 + i$

A) $1 - i, 5$ B) $-5, 5$ C) $1 - i, 5i$ D) $1 - i, -5$

Problem: 22

Use the Change of Base formula and a calculator to evaluate the logarithm. Round your answer to three decimal places.

$\log_2 60.29$

A) 0.169 B) 1.780 C) 5.914 D) 30.145

Problem: 23

Use the properties of logarithms to evaluate the expression. Do not use a calculator.

$\log_3 3^{10}$

A) 30 B) 1 C) 10 D) 3

Problem: 24

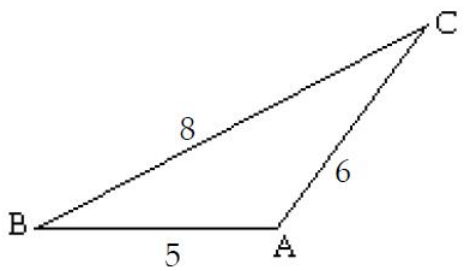
Use the properties of logarithms to evaluate the expression. Do not use a calculator

$\ln e^{\sqrt{7}}$

A) 49 B) 7 C) $\sqrt{7}$ D) e

Problem: 25

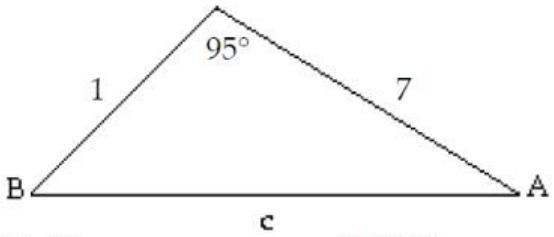
Find the area of the triangle. If necessary, round the answer to two decimal places.



A) 44.74 B) 195.03 C) 14.98 D) 4.86

Problem: 26

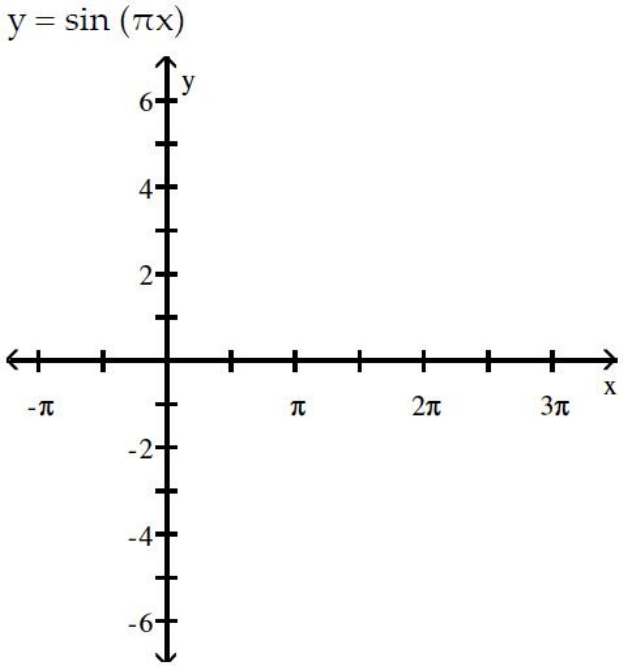
Find the area of the triangle. If necessary, round the answer to two decimal places.



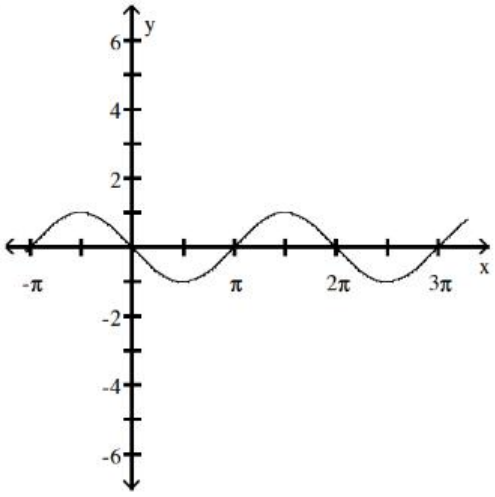
A) 3.49 B) 13.95 C) 4.29 D) 0.31

Problem: 27

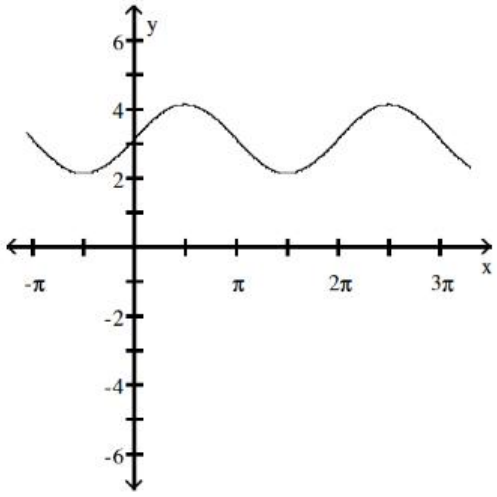
Use transformations to graph the function.



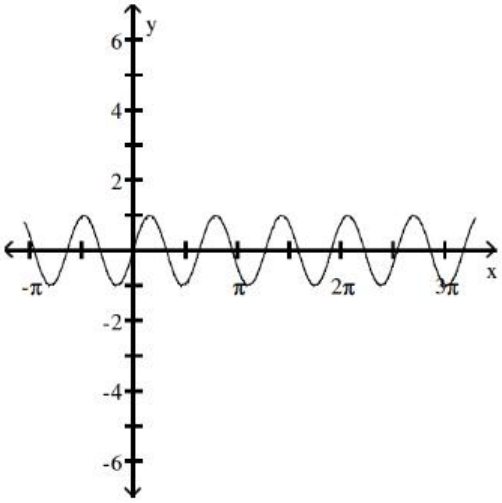
A)


y
6
4
2
-2
-4
-6
x
-π
π
2π
3π

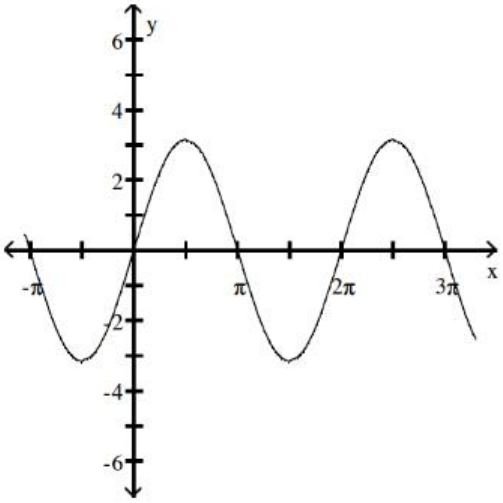
B)


y
6
4
2
-2
-4
-6
x
-π
π
2π
3π

C)


y
6
4
2
-2
-4
-6
x
-π
π
2π
3π

D)


y
6
4
2
-2
-4
-6
x
-π
π
2π
3π

Problem: 28

Express the sum or difference as a product of sines and/or cosines.

$\cos(10\theta) - \cos(4\theta)$

A) $-2\cos(7\theta)\sin(3\theta)$

B) $2\cos(3\theta)$

C) $2\cos(7\theta)\cos(3\theta)$

D) $-2\sin(7\theta)\sin(3\theta)$

Problem: 29

Two sides of a triangle are given. Determine whether the given information results in one triangle, two triangles, or no triangles at all. Solve any triangle(s) that results.

$a = 7, b = 9, B = 49°$

A) one triangle
$A = 35.94°, C = 95.06°, c = 11.88$

B) two triangles
$A_1 = 76.01°, C_1 = 54.99°, c_1 = 7.60$ or
$A_2 = 103.99°, C_2 = 27.01, c_2 = 12.14$

C) one triangle
$A = 76.01°, C = 54.99°, c = 7.60$

D) no triangle

Problem: 30

Simplify the expression.

$$\frac{\cos\theta}{1 + \sin\theta} + \tan\theta$$

A) 1

B) $\sin^2\theta$

C) $\cos\theta + \sin\theta$

D) $\sec\theta$

Problem: 31

Use the Change of Base formula and a calculator to evaluate the logarithm. Round your answer to two decimal places.

$\log_3 25$

A) 1.10 B) 3.22 C) 0.34 D) 2.93

Problem: 32

Find the center (h, k) and radius r of the circle with the given equation.

$(x - 1)^2 + (y + 1)^2 = 25$

A) (h, k) = (−1, 1); r = 5
B) (h, k) = (1, −1); r = 25
C) (h, k) = (1, −1); r = 5
D) (h, k) = (−1, 1); r = 25

Problem: 33

Solve the equation on the interval $0 \le \theta \le 2\pi$.

$2 \sin^2 \theta = \sin \theta$

A) $0, \pi, \frac{\pi}{6}, \frac{5\pi}{6}$ B) $\frac{\pi}{3}, \frac{2\pi}{3}$ C) $\frac{\pi}{2}, \frac{3\pi}{2}, \frac{\pi}{3}, \frac{2\pi}{3}$ D) $\frac{\pi}{6}, \frac{5\pi}{6}$

Problem: 34

Solve the equation on the interval $0 \le \theta \le 2\pi$.

$2 \cos \theta + 3 = 2$

A) $\frac{5\pi}{6}, \frac{7\pi}{6}$ B) $\frac{2\pi}{3}, \frac{5\pi}{3}$ C) $\frac{2\pi}{3}, \frac{4\pi}{3}$ D) $\frac{5\pi}{6}, \frac{11\pi}{6}$

Problem: 35

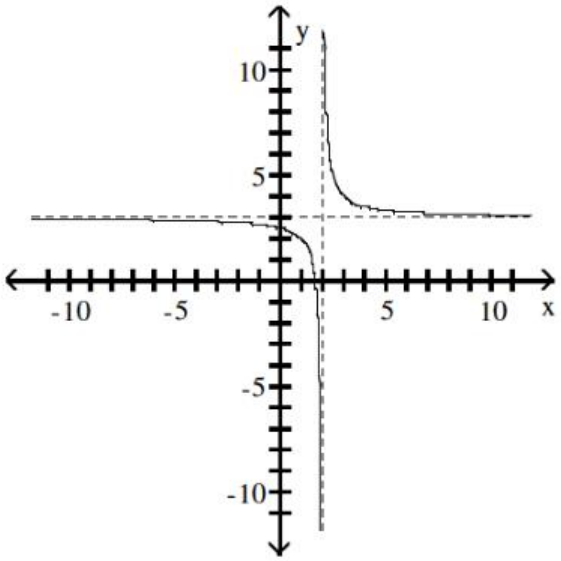
Find the domain of the function.

$f(x) = \sqrt{21 - x}$

A) $\{x \mid x \ne \sqrt{21}\}$ B) $\{x \mid x \le 21\}$ C) $\{x \mid x \ne 21\}$ D) $\{x \mid x \le \sqrt{21}\}$

Problem: 36

Use the graph to determine the domain and range of the function.



A) domain: $\{x \mid x \neq 3\}$
range: $\{y \mid y \neq -2\}$

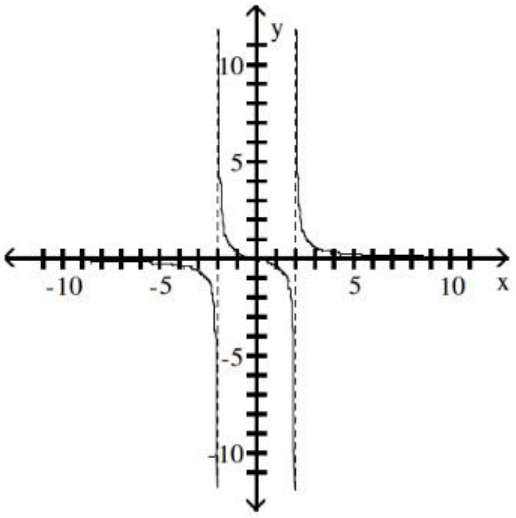
B) domain: $\{x \mid x \neq 2\}$
range: $\{y \mid y \neq 3\}$

C) domain: $\{x \mid x \neq 3\}$
range: $\{y \mid y \neq 2\}$

D) domain: $\{x \mid x \neq -2\}$
range: $\{y \mid y \neq 3\}$

Problem: 37

Use the graph to determine the domain and range of the function.



A) domain: $\{x \mid x \neq -2, x \neq 2\}$
range: all real numbers

B) domain: all real numbers
range: all real numbers

C) domain: $\{x \mid x \neq -2, x \neq 2\}$
range: $\{y \mid y \neq 0\}$

D) domain: all real numbers
range: $\{y \mid y \neq -2, y \neq 2\}$

Problem: 38

Solve the equation

$\log_2 x = 3$

A) {9} B) {1.58} C) {6} D) {8}

Problem: 39

Solve the equation

$\log(3x) = \log 4 + \log(x - 1)$

A) $\left\{-\frac{4}{7}\right\}$ B) $\{-4\}$ C) $\{4\}$ D) $\left\{\frac{3}{2}\right\}$

Problem: 40

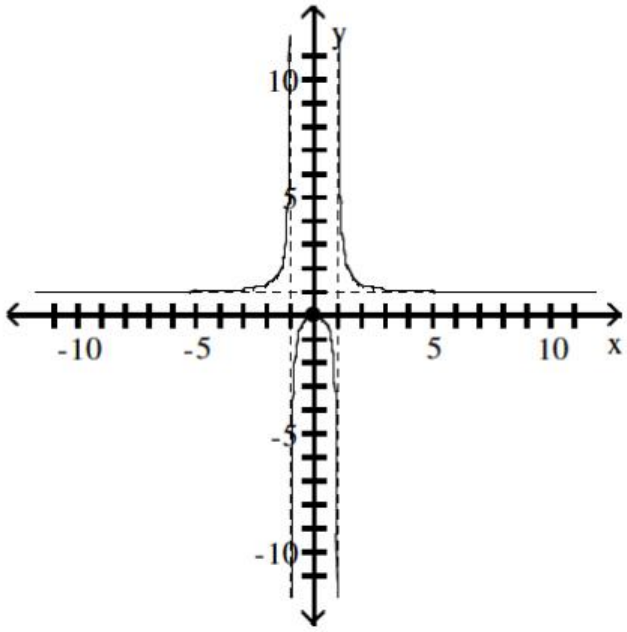
A point on the terminal side of the angle θ is given. Find the exact value of the indicated trigonometric function of θ.

$(-3, -4)$ Find $\sin\theta$.

A) $\frac{3}{5}$ B) $-\frac{3}{5}$ C) $-\frac{4}{5}$ D) $\frac{4}{5}$

Problem: 41

Use the graph to find the horizontal asymptote, if any, of the function.



A) $y = -1, y = 1$

B) $y = 1$

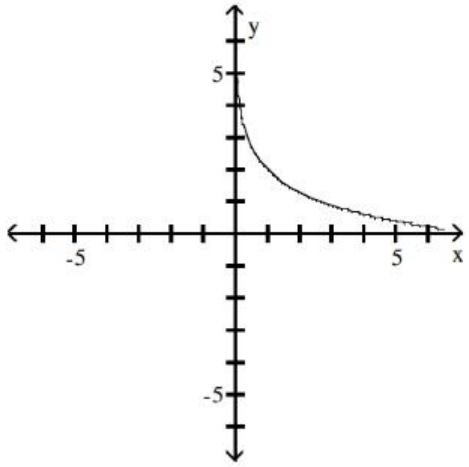
C) $x = -1, x = 1, y = 1$

D) $y = 0, y = 1$

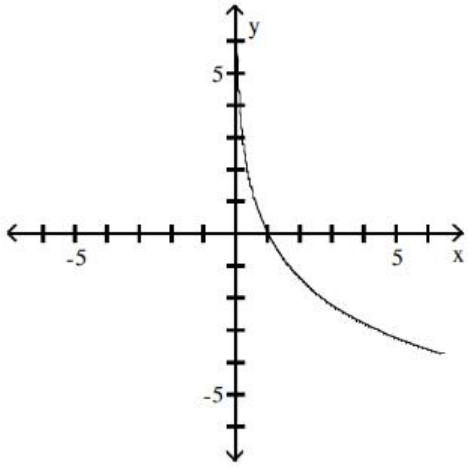
Problem: 42

Identify the graph the function $f(x) = 2\ln x$, without a calculator.

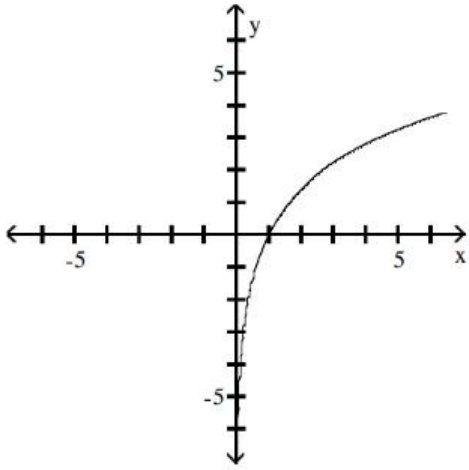
A)



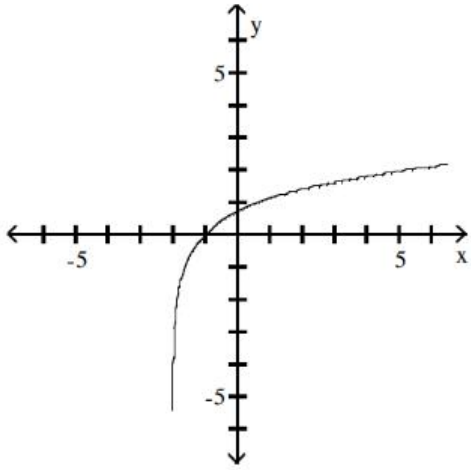
B)



C)



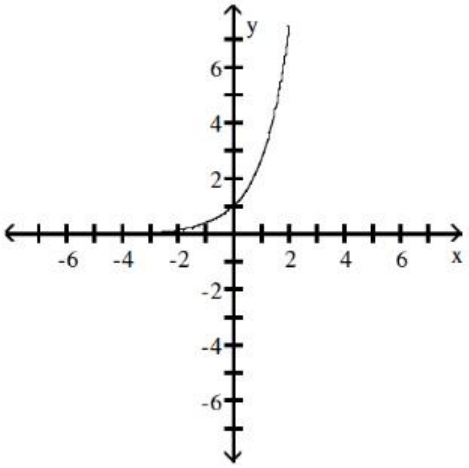
D)



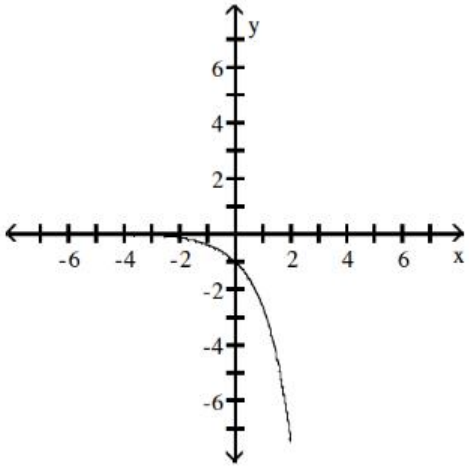
Problem: 43

Identify the graph of $f(x) = e^x$, without a calculator.

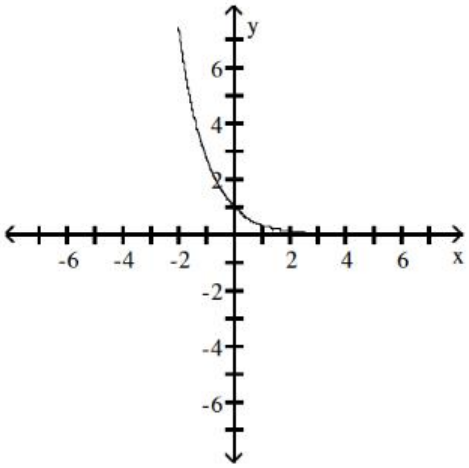
A)



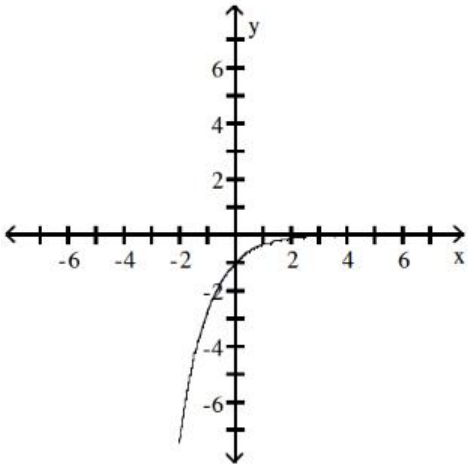
B)



C)

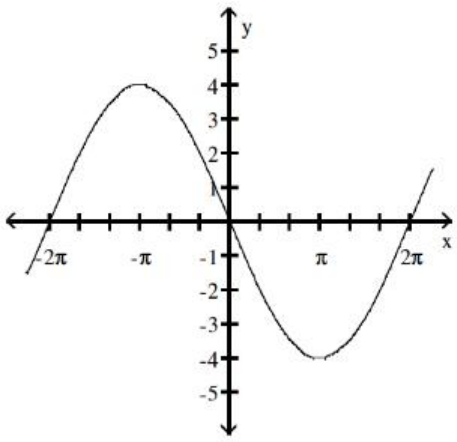


D)



Problem: 44

Find an equation for the given graph.



A) $y = -4\cos(2x)$ B) $y = -4\sin\left(\frac{1}{2}x\right)$ C) $y = -4\cos\left(\frac{1}{2}x\right)$ D) $y = -4\sin(2x)$

Problem: 45

Find the domain of the rational function.

$$G(x) = \frac{x+4}{x^2+1}$$

A) $\{x \mid x \neq -1, x \neq 1\}$ B) $\{x \mid x \neq 0, x \neq -1\}$
C) $\{x \mid x \neq -1, x \neq 1, x \neq -4\}$ D) all real numbers

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Problem: 46

Find the intercepts of the function $f(x)$.

$f(x) = x^3 + 2x^2 - 9x - 18$

A) x-intercept: -3; y-intercept: -18
B) x-intercepts: -3, -2, 3; y-intercept: -18
C) x-intercepts: -3, 2, 3; y-intercept: -18
D) x-intercept: -2; y-intercept: -18

Problem: 47

Give the equation of the horizontal asymptote, if any, of the function.

$$G(x) = \frac{x^2 + 1x - 9}{x - 9}$$

A) $y = 0$
B) $y = 1$
C) $y = 9$
D) none

Problem: 48

Find the amount that results from the investment.

$12,000 invested at 7% compounded quarterly after a period of 4 years

A) $3839.15 B) $15,729.55 C) $15,566.73 D) $15,839.15

Problem: 49

Solve the equation in the real number system

$x^3 + 9x^2 + 26x + 24 = 0$

A) {3, 4} B) {2, 3, 4} C) {-4, -3, -2} D) {-4, -3}

Problem: 50

Use the information given about the angle θ, for $0 \le \theta \le 2\pi$, to find the exact value of the indicated trigonometric function of θ.

$\sin\theta = \frac{5}{13}, \quad 0 < \theta < \frac{\pi}{2}$ Find $\cos(2\theta)$.

A) $\frac{119}{169}$ B) $\frac{118}{169}$ C) $\frac{120}{169}$ D) $-\frac{119}{169}$

ANSWER KEY

Problem	Answer	Problem	Answer
1	B	**26**	A
2	C	**27**	C
3	B	**28**	D
4	B	**29**	A
5	C	**30**	D
6	B	**31**	D
7	A	**32**	C
8	C	**33**	A
9	B	**34**	C
10	D	**35**	B
11	C	**36**	B
12	C	**37**	A
13	A	**38**	D
14	D	**39**	C
15	D	**40**	C
16	A	**41**	B
17	A	**42**	C
18	D	**43**	A
19	B	**44**	B
20	A	**45**	D
21	D	**46**	B
22	C	**47**	D
23	C	**48**	D
24	C	**49**	C
25	C	**50**	A