

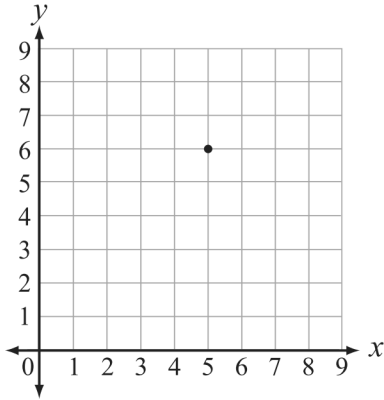
Pre-Cal Review

Name: _____

Date: _____

If you have any questions, please clearly mark them. Your effort here is essential to your success on this exam.

1. Henrietta is graphing a line. She graphed a point on the line, as shown below.



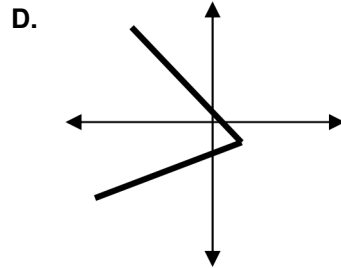
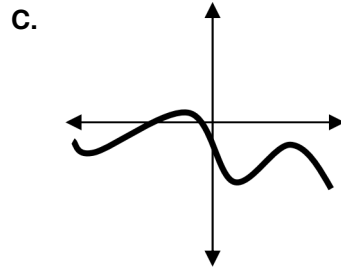
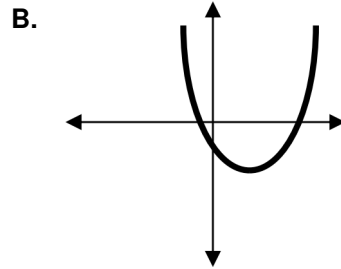
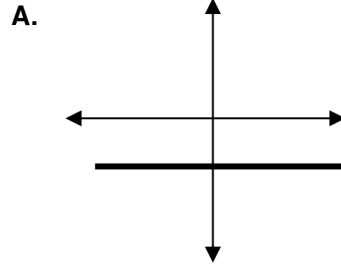
The slope of the line will be $\frac{2}{3}$. Which point will also lie on the line?

- A. (7,9) B. (8,8) C. (7,8) D. (8,9)

2. Which relation is a function?

- A. $\{(-1, 3), (-2, 6), (0, 0), (-2, -2)\}$
B. $\{(-2, -2), (0, 0), (1, 1), (2, 2)\}$
C. $\{(4, 0), (4, 1), (4, 2), (4, 3)\}$
D. $\{(7, 4), (8, 8), (10, 8), (10, 10)\}$

3. Which graph does *not* represent a function?



4. Which table represents y as a function of x ?

A.

x	1	2	3	2	1
y	1	2	3	4	5

B.

x	4	5	4	3	2
y	-6	-5	-4	-3	-2

C.

x	8	7	6	5	4
y	-1	2	-1	2	-1

D.

x	3	4	3	2	3
y	0	1	2	1	3

5. Which set of ordered pairs models a function?

A. $\{(2, 9), (7, 5), (3, 14), (2, 6)\}$

B. $\{(5, 10), (5, 15), (5, 20), (5, 25)\}$

C. $\left\{\left(-\frac{1}{2}, -\frac{1}{3}\right), \left(\frac{1}{2}, -\frac{1}{4}\right), \left(-\frac{1}{2}, -\frac{1}{5}\right), \left(\frac{1}{2}, -\frac{1}{6}\right)\right\}$

D. $\{(-10, 20), (-20, 30), (-30, 40), (-40, 10)\}$

6. The table below represents a linear relationship.

x	y
0	-3
2	2
4	7
6	12

Based on the table, what is the value of x when $y = 22$?

- A. 52 B. 16 C. 10 D. 8

7. In which table is y a function of x ?

A.

x	y
-3	6
2	5
3	2
2	3

B.

x	y
-1	0
5	2
7	3
5	4

C.

x	y
2	-1
3	0
4	-5
5	7

D.

x	y
0	6
-1	3
2	4
-1	5

8. Which expression represents $f(g(x))$ if $f(x) = x^2 - 1$ and $g(x) = x + 3$?

- A. $x^3 + 3x^2 - x - 3$ B. $x^2 + 6x + 8$
C. $x^2 + x + 2$ D. $x^2 + 8$

9. If $f(x) = x^2 - x$ and $g(x) = x - 1$, what is $f(g(x))$?

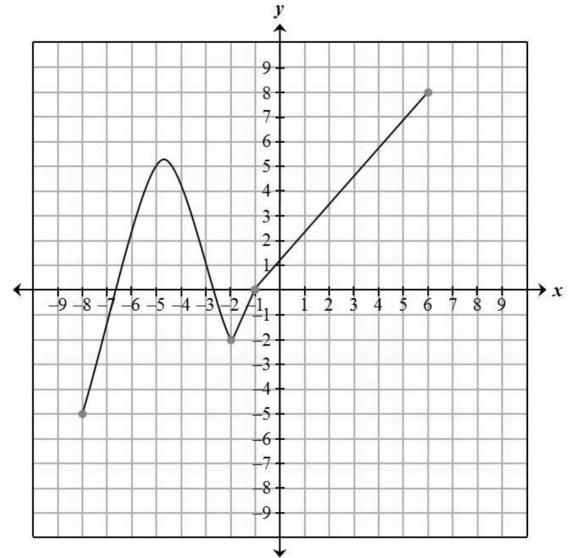
- A. $x^2 - x - 1$ B. $x^2 - x - 2$
C. $x^2 - 3x + 2$ D. $x^2 - 3x + 1$

10. What is the sum of the function $f(x) = 200(2)^x$ and the function $g(x) = 50$?

- A. $h(x) = 250(2)^x$
B. $h(x) = 200(2)^x + 50$
C. $h(x) = 200(2)^x + 50x$

11. If $f(x) = x^2 + 4x - 12$, find $f(2)$.

12. Which expression represents the range of the function shown in the graph below?



- A. $-8 \leq x \leq 6$ B. $-5 \leq x \leq 8$
C. $-8 \leq y \leq 6$ D. $-5 \leq y \leq 8$

13. Given $f(x) = x^3 + x^2 - x$, what is $f(4)$?

- A. 16 B. 76 C. 256 D. 1,024

14. Which table below correctly describes points of the exponential function $f(x) = 3^{-x} - 2$?

A.

x	-2	-1	0
$f(x)$	-18	-6	-2

B.

x	-2	-1	0
$f(x)$	-4	-5	-2

C.

x	-2	-1	0
$f(x)$	$-1\frac{8}{9}$	$-1\frac{2}{3}$	-1

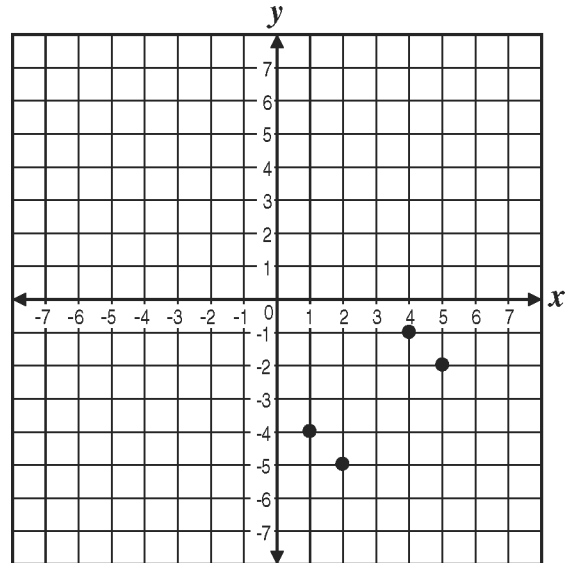
D.

x	-2	-1	0
$f(x)$	7	1	-1

15. Given that $f(x) = 3x^2 - 4$ and $g(x) = 2x - 6$, what is $g(f(2))$?

- A. -2 B. 6 C. 8 D. 10

16. What is the domain of the function shown on the graph below?



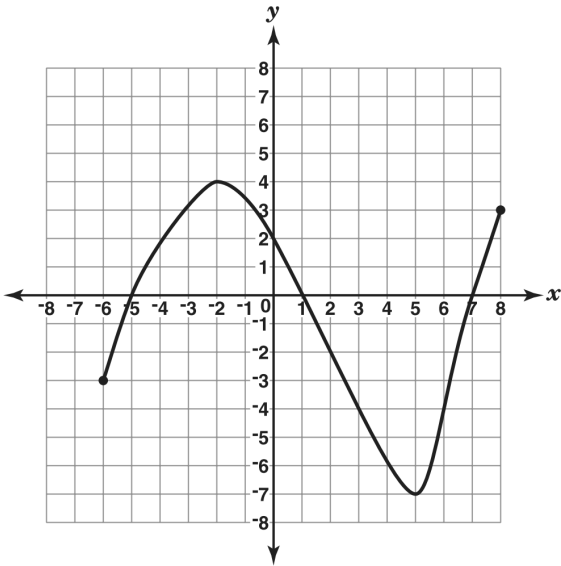
- A. $\{-1, -2, -3, -4\}$ B. $\{-1, -2, -4, -5\}$
 C. $\{1, 2, 3, 4\}$ D. $\{1, 2, 4, 5\}$

17. Use the function to answer the question.

$$f(x) = \frac{1}{4-x}$$

For what value in the domain is this function undefined? Explain your answer.

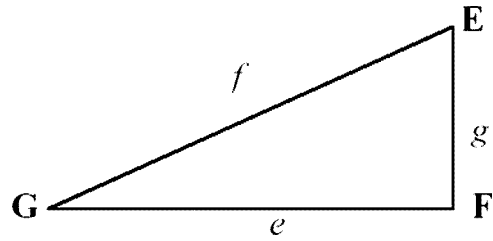
18. Look at the function that is graphed below.



What is the range of this function?

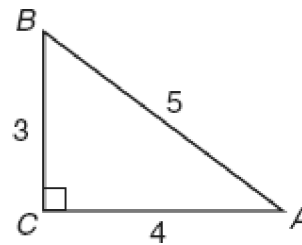
- A. $-7 \leq y \leq 4$ B. $-6 \leq y \leq 8$
 C. $-5 \leq y \leq 7$ D. $-2 \leq y \leq 5$
19. What is the range (all possible y -values) of the function $y = x^2 - 9$ if x is any real number?
- A. all real numbers except 3
 B. all real numbers except -3
 C. all real numbers greater than or equal to 9
 D. all real numbers greater than or equal to -9

20. What is the tangent of $\angle G$ in the triangle below?



- A. $\frac{g}{e}$ B. $\frac{e}{g}$ C. $\frac{g}{f}$ D. $\frac{e}{f}$

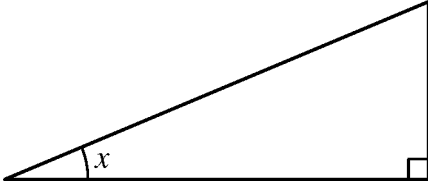
21. Triangle ABC is shown below.



What is the cosine of angle B ?

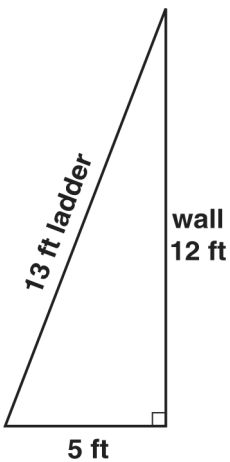
- A. $\frac{3}{5}$ B. $\frac{4}{5}$ C. $\frac{5}{4}$ D. $\frac{5}{3}$

22. In the figure below, if $\sin x = \frac{5}{13}$, what are $\cos x$ and $\tan x$?



- A. $\cos x = \frac{12}{13}$ and $\tan x = \frac{5}{12}$
 B. $\cos x = \frac{12}{13}$ and $\tan x = \frac{12}{5}$
 C. $\cos x = \frac{13}{12}$ and $\tan x = \frac{5}{12}$
 D. $\cos x = \frac{13}{12}$ and $\tan x = \frac{13}{5}$

23. A 13-foot ladder is leaning against a brick wall. The top of the ladder touches the wall 12 feet (ft) above the ground. The bottom of the ladder is 5 ft from the bottom of the wall. What is the sine of the angle formed by the ground and the base of the ladder?

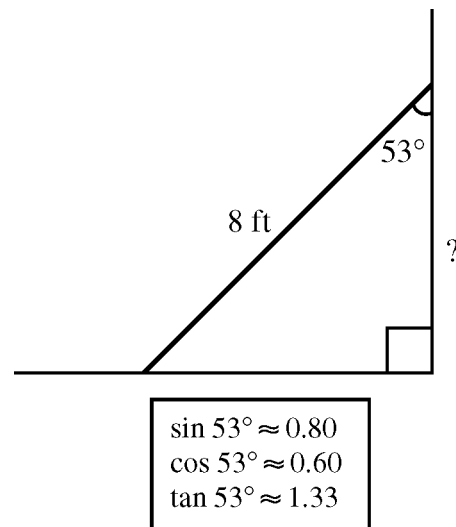


- A. $\frac{5}{12}$ B. $\frac{5}{13}$ C. $\frac{12}{13}$ D. $\frac{13}{5}$

24. In $\triangle ABC$ where C is a right angle, $\sin A = \frac{\sqrt{7}}{4}$. What is $\cos B$?

- A. $\frac{\sqrt{7}}{4}$ B. $\frac{\sqrt{7}}{3}$ C. $\frac{3}{4}$ D. $\frac{3}{\sqrt{7}}$

25. The diagram shows an 8-foot ladder leaning against a wall. The ladder makes a 53° angle with the wall. Which is closest to the distance up the wall the ladder reaches?

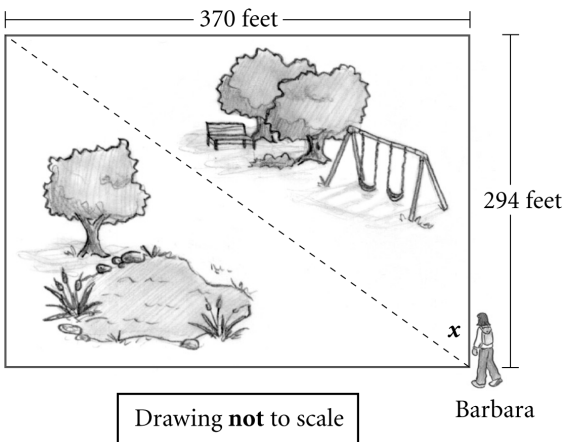


- A. 3.2 ft B. 4.8 ft C. 6.4 ft D. 9.6 ft

26. The short leg of a right triangle is 10 meters and the acute angles measure 25° and 65° . Use trigonometry and a calculator to find the measures of the longer leg of the right triangle.

- A. 10 meters B. 11.03 meters
 C. 18.66 meters D. 21.45 meters

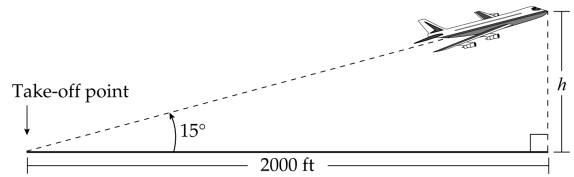
27. Barbara went for a walk in the city park. To cut across the rectangular park, she chose the path shown by the dotted line in the drawing below.



At what angle, x , did Barbara cut across the park? Round the answer to the nearest tenth of a degree.

- A. 37.4 B. 38.5 C. 51.5 D. 52.6

28. An airplane makes a 15° angle of elevation from the runway when it takes off. The airplane pictured below is 2,000 feet along the ground from its take-off point.



Note: The figure is not drawn to scale.

At what height (h) is the airplane? Round the answer to the nearest foot.

- A. 500 feet B. 518 feet
 C. 536 feet D. 550 feet

29. The point $(-3, 2)$ lies on a circle whose equation is $(x + 3)^2 + (y + 1)^2 = r^2$. Which of the following must be the radius of the circle?

- A. 3 B. $\sqrt{10}$ C. 9 D. 10

30. What is the solution to the equation $5^x = 17$?

- A. $x = 2$
 B. $x = \log_{10} 2$
 C. $x = \log_{10} 17 + \log_{10} 5$
 D. $x = \frac{\log_{10} 17}{\log_{10} 5}$

31. In 1984, the population of Greensboro, N.C. was 197,910. According to the U.S. Census Bureau, Greensboro has been growing at the rate of 6.9% annually since 1984. What equation models the population of Greensboro t years after 1984?

- A. $y = 197,910(1 + 0.69)^t$
- B. $y = 197,910(1 + 69)^t$
- C. $y = 197,910(1 + 6.9)^t$
- D. $y = 197,910(1 + 0.069)^t$

32. Which of the following functions will represent \$500 placed into a mutual fund yielding 10% per year for 4 years.

- A. $A = 500(.10)^4$
- B. $A = 500(1.1)^4$
- C. $A = 500(4)(.10)$
- D. $A = 500(1.04)^{10}$

33. The population of a small town in North Carolina is 4,000, and it has a growth rate of 3% per year. Which expression can be used to calculate the town's population x years from now?

- A. $3(4,000)^x$
- B. $4,000(1.03)^x$
- C. $4,000x^{1.03}$
- D. $4,000x^3$

34. On January 1, 2000, a car had a value of \$15,000. Each year after that, the car's value will decrease by 20 percent of the previous year's value. Which expression represents the car's value on January 1, 2003?

- A. $15,000(0.8)^3$
- B. $15,000(0.8)^4$
- C. $15,000(0.2)^3$
- D. $15,000(0.2)^4$

35. The student population in the Greenville school system is increasing about 10% each year. This year there are 3120 students in the Greenville school system. If this trend continues, which of the following is closest to the number of students who will be in this school system 3 years from now?

- A. 3400
- B. 4000
- C. 4200
- D. 9400

36. Which of the following points is on the circle with equation: $(x - 1)^2 + (y + 2)^2 = 5$?

- A. $(1, -2)$
- B. $(2, 2)$
- C. $(3, -1)$
- D. $(3, 4)$

37. Nathan drew a circle on a grid with a radius of 4 units and the point $(2, -1)$ as its center. Which of the following pairs of coordinates represent points on the circle?

- A. $(2, -5)$ and $(6, -1)$
- B. $(2, 3)$ and $(-1, -1)$
- C. $(4, 0)$ and $(0, 4)$
- D. $(8, -4)$ and $(6, -3)$

38. On a map, the points $(2, 1)$, $(5, 2)$, and $(3, 4)$ are located on the circular boundary of a town. Which point locates the center of the town?

- A. $(1, -3)$
- B. $(\frac{1}{2}, -3)$
- C. $(8, -12)$
- D. $(-1, 3)$

39. A broadcast tower is located at point $(-1, 3)$ on an xy -coordinate grid, where each unit is one mile. If its broadcast reaches only a 20-mile radius, what is the set of points where the broadcast is received by its listeners?

- A. $(x + 1)^2 + (y - 3)^2 \leq 400$
- B. $(x + 1)^2 + (y - 3)^2 \geq 400$
- C. $(x - 1)^2 + (y - 3)^2 \geq 400$
- D. $(x - 1)^2 + (y + 3)^2 \leq 400$

40. The endpoints of a diameter of a circle are $(-4, 7)$ and $(2, -1)$. What is the equation of the circle in standard form?

- A. $(x - 1)^2 + (y + 3)^2 = 25$
- B. $(x + 1)^2 + (y - 3)^2 = 25$
- C. $(x - 1)^2 + (y + 3)^2 = 100$
- D. $(x + 1)^2 + (y - 3)^2 = 100$