

Calculus
Algebra / Pre-Calc Review

Name:
Date:

Key

The following problems cover topics that should be familiar to you from studying Algebra, Geometry, and Pre-Calculus. The format of some of the problems may look different, but the concepts have been covered in previous math classes.

Section 1: Simplifying Expressions

1. If $x = 3$, $y = 5$ and $\frac{1}{z} = \frac{1}{x} + \frac{1}{y}$, then $z =$

1. $\frac{15}{8}$

2. Simplify using only positive exponents: $\frac{x^{-2}y^{-6}}{3x^{-4}y^3}$

2. $\frac{x^2}{3y^9}$

3. Factor completely: $5x^3 - 15x^2 + 25x$.

3. $5x(x^2 - 3x + 5)$

4. Express in simplest form: $\sqrt{4x^2 + 36x + 81}$.

4. $|2x + 9|$

5. Express in simplest form: $\frac{3x^2 + 11x - 4}{2x^2 + 11x + 12}$

5. $\frac{3x-1}{2x+3}$

6. Express in simplest form: $\frac{\frac{1}{x} - \frac{1}{x^2}}{x}$.

6. $\frac{x-1}{x^3}$

7. Express as a sum: $\log_2[(\sqrt[3]{x})^y] =$

7. $\frac{1}{3} \log_2 x + \log_2 y$

Section 2: Solving Equations

8. Solve for g: $s = \frac{1}{2} gt^2$.

8. $\frac{2s}{t^2}$

9. Solve for x: $3x^2 - 5x = 2$

9. $-\frac{1}{3}, 2$

10. If the two solutions of the quadratic equation $4x^2 + 4x + k = 0$ are equal, then $k =$ _____?

10. $k = 1$

11. If the roots of a quadratic equation are $\frac{-3}{2}$, $\frac{4}{5}$, then the quadratic equation could be written as _____.

11. $10x^2 + 7x - 12$

12. Solve for x: $x^6 - 16x^4 = 0$

12. $0, 4, -4$

13. Solve for x: $|5x - 2| = 8$

13. 2, -6/5

14. Solve for x: $\frac{2x-1}{x+3} = -2$

14. -5/4

15. Solve for x: $\frac{1}{3} = 3^{2x+2}$

15. -3/2

16. Solve for x: $\log_2(6 - 2x) - \log_2 x = 3$

16. 3/5

17. Given the system $\begin{cases} 3x + y = 1 \\ x - 3y = 17 \end{cases}$, find x.

17. 2

Section 3: Equations of Lines and Circles

18. Find the slope of the line through (-3,-6) and (5,-2).

18. 1/2

19. Find the equation of the line with slope 2 and intercept (0, 5).

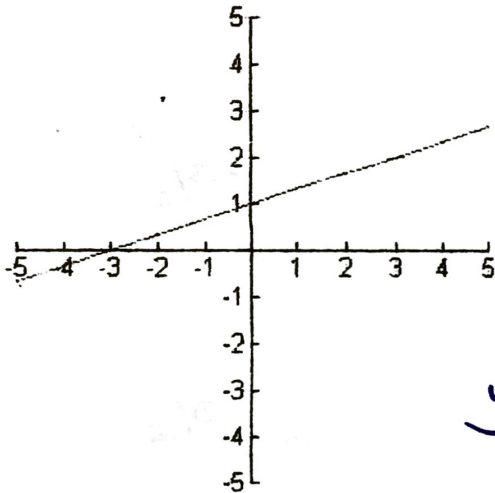
19. $y = 2x + 5$

20. Find the equation of the line with slope $-\frac{1}{2}$ through point (2, 5).

20. $y = -\frac{1}{2}x + 6$

21. Find the equation of the line in the figure below.

21. $y = \frac{1}{3}x + 1$



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

Section 4: Trigonometry Basics

23. Evaluate the following:

a. $\sin 0 = \underline{0}$?

b. $\cos 0 = \underline{1}$?

c. $\sin \pi = \underline{0}$?

d. $\cos \pi = \underline{-1}$?

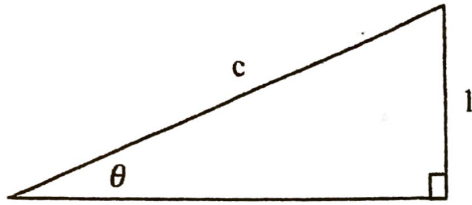
e. $\sin \frac{\pi}{2} = \underline{1}$?

f. $\cos \frac{\pi}{2} = \underline{0}$?

24. What is the radian measure of an angle whose degree is 72° ?

24. $\frac{2\pi}{5}$

25. In the figure below, $\tan \theta =$ _____?



25. $\frac{1}{\sqrt{c^2-1}}$

Section 5: Functions

26. If $f(x) = x^2 - 1$ and $g(x) = 2x + 1$, then the composite function $f \circ g$ is defined by $(f \circ g)(x) =$ _____?

26. $4x^2 + 4x$

27. If $f(x) = ax + b$ and $f(2) = f(4)$, then $a =$ _____?

27. 0

28. If $f(x) = x^2 + 2x + 3$, then $f(a-1) =$ _____?

28. $a^2 + 2$

29. If $f(x) = 2x^2 + 1$, then $f(x+h) =$ _____?

29. $2x^2 + 4xh + 2h^2 + 1$

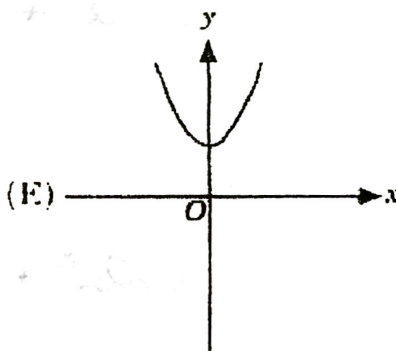
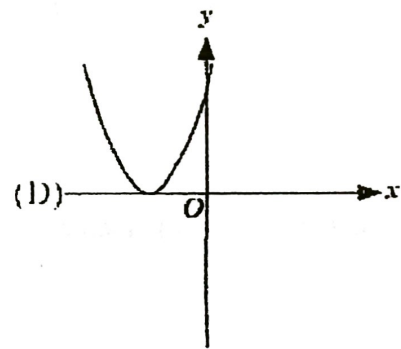
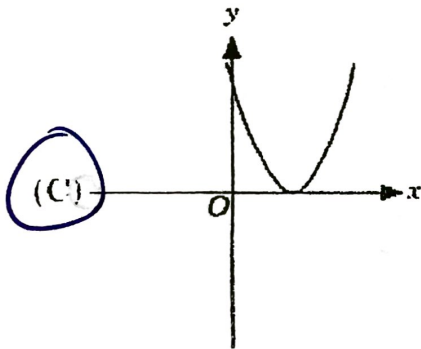
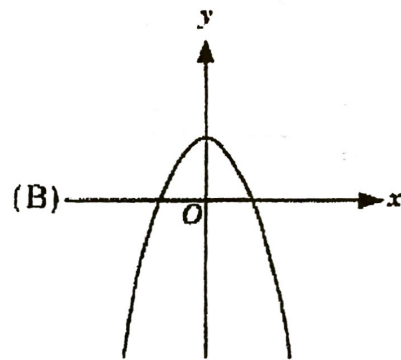
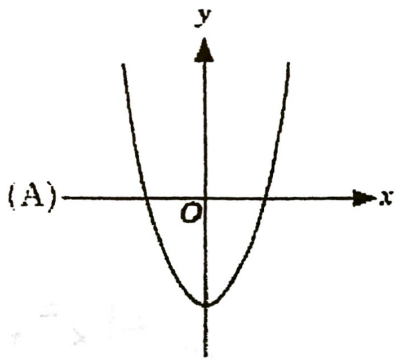
30. Write a function that is decreasing over its entire domain.

30. $-x + 2$

31. The perimeter of a rectangular field is P feet. The width of the field is 200 feet less than its length. In terms of P , what is the length of the field in feet?

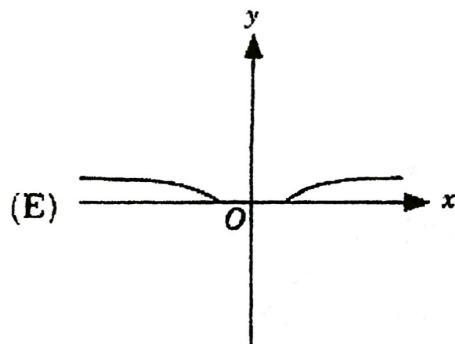
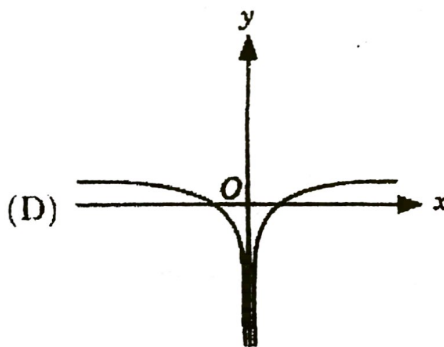
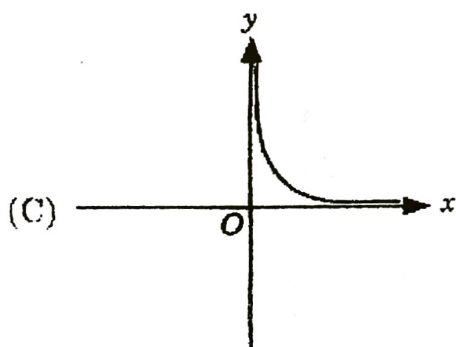
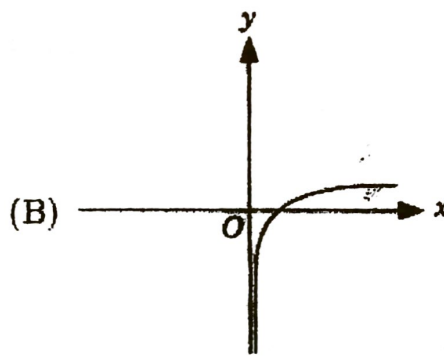
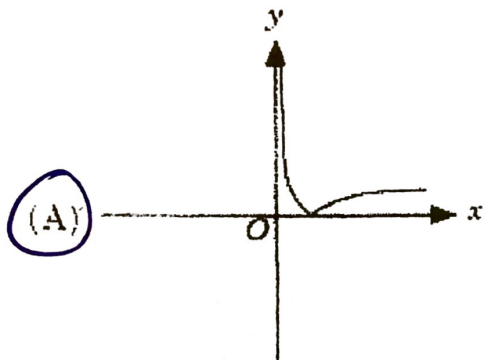
31. $\frac{P}{4} + 100$

32.) Which of the following could be a portion of the graph of $y = (x - 2)^2$?



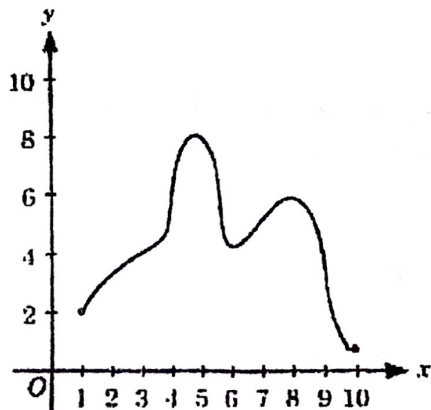
No Answer Selected

33) Which of the following could be a portion of the graph of $y = |\log_2 x|$?

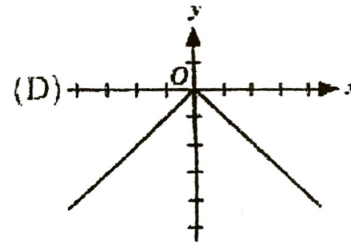
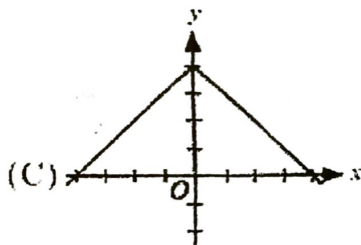
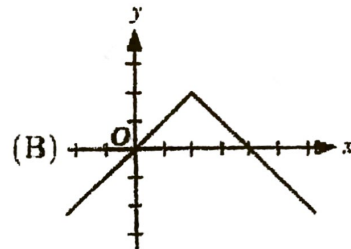
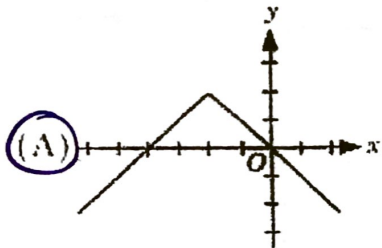
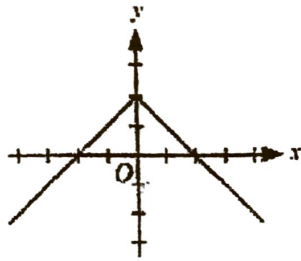


34) The graph of the function $y = f(x)$ is shown to the right. For exactly how many values of x does $f(x) = 3$?

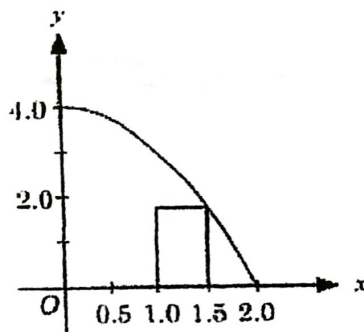
2



- 35.) The graph of $y = h(x)$ is shown in the figure to the right. Which of the following could be the graph of $y = h(x + 2)$?



- 36.) A portion of the graph of $f(x) = 4 - x^2$ is shown to the right. What is the area of the shaded rectangle?



0.875

- 37.) What is the area of the region bounded by the graph of $y = x + 3$, the x-axis, and the vertical lines $x = 3$ and $x = 5$?

(A) 2

(B) 4

(C) 7

(D) 14

(E) 28

No Answer Selected