
1. If $x = \frac{1}{8}$ then $x + \frac{1}{x} - 7 =$

- (A) $-\frac{55}{8}$ (B) -6 (C) $\frac{1}{8}$ (D) $\frac{9}{8}$ (E) $\frac{65}{8}$
-

2. If $\frac{x}{6} + 1 = \frac{7}{5}$ then $x =$

- (A) $\frac{12}{25}$ (B) $\frac{12}{5}$ (C) $\frac{37}{5}$ (D) $\frac{42}{5}$ (E) $\frac{72}{5}$
-

3. $\frac{a}{6b} + \frac{a}{5b} =$

- (A) $11ab$ (B) $30ab$ (C) $\frac{2a}{11b}$ (D) $\frac{11a}{30b}$ (E) $\frac{11a}{30b^2}$
-

4. If $y > 0$ then $\sqrt{169y^2 - 25y^2} =$

- (A) $144y$ (B) $13y$ (C) $12y$ (D) $8y$ (E) y
-

5. If $\log_{10} w = 5$ then $w =$

- (A) $\frac{1}{100,000}$ (B) $\frac{5}{10}$ (C) 10 (D) $10,000$ (E) $100,000$
-

6. $\frac{r+1}{r^2-9} \cdot \frac{9r-27}{3r+3} =$

- (A) $\frac{1}{r}$ (B) $\frac{3}{r}$ (C) $\frac{3}{r+3}$ (D) $\frac{3}{r-3}$ (E) $\frac{-6}{r-9}$
-

7. $(8)^{2/3} (16)^{1/4} =$
(A) 2 (B) 4 (C) 8 (D) 16 (E) 32

8. If $f(x) = x^2 - kx + 7$ and $f(2) = -9$, then $k =$
(A) 10 (B) 2 (C) -1 (D) -9 (E) -10

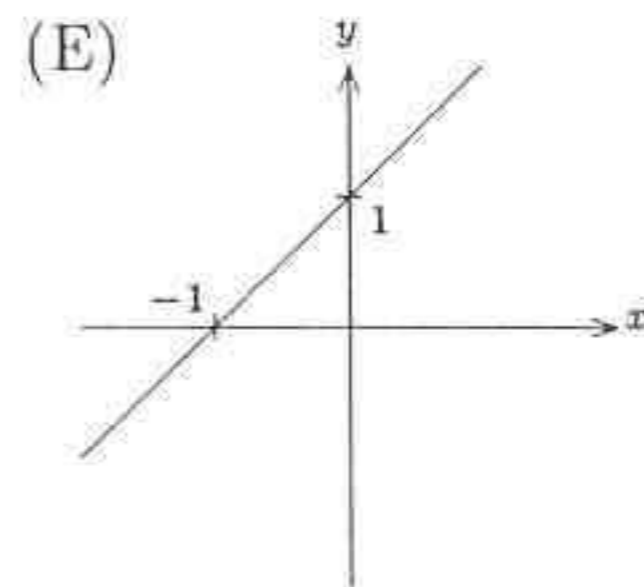
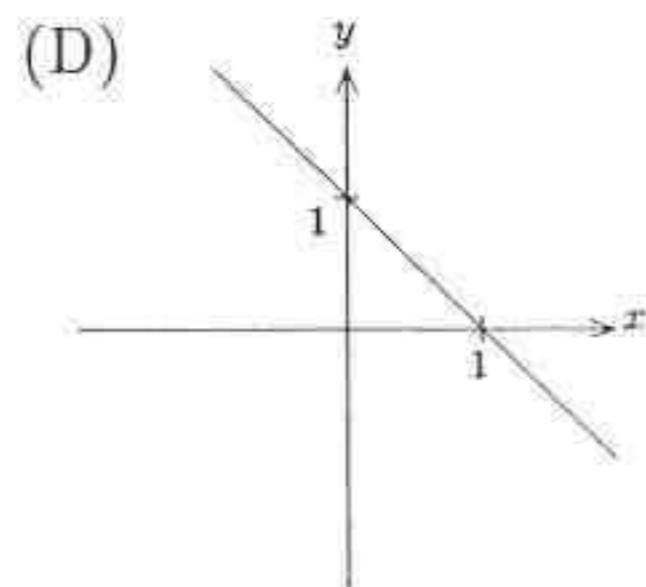
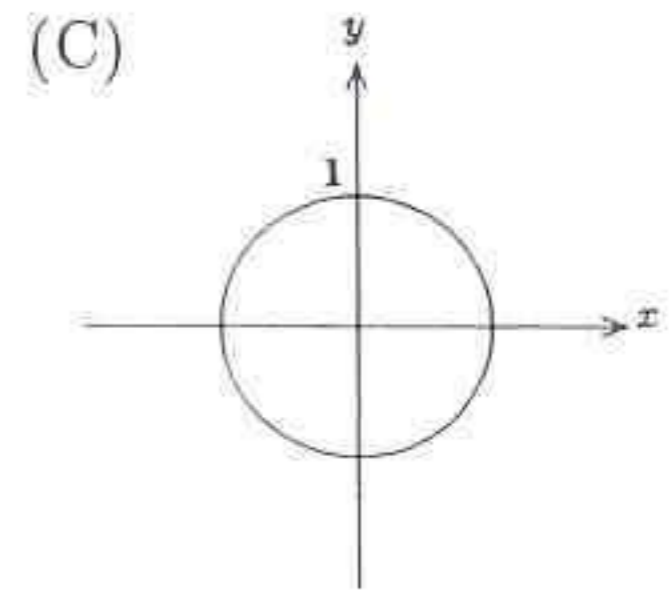
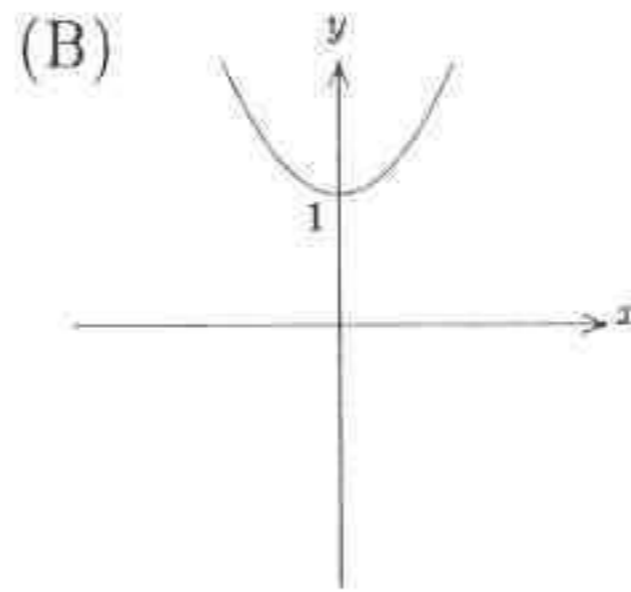
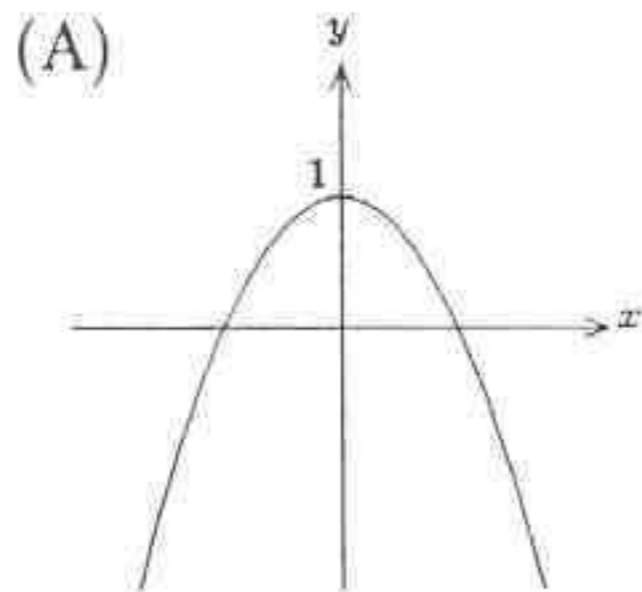
9. $\frac{1}{1 - \sqrt{3}} =$
(A) $-\frac{1 + \sqrt{3}}{8}$ (B) $-\frac{1 + \sqrt{3}}{2}$ (C) $\frac{1 - \sqrt{3}}{2}$ (D) $\frac{1 + \sqrt{3}}{2}$ (E) $\frac{-1 + \sqrt{3}}{8}$

10. If, for all values of x , $(x + k)^2 = k^2 + 2x + x^2$, then $k =$
(A) -2 (B) -1 (C) 0 (D) 1 (E) 2

11. If $a \neq b$ and $a(x + b) = bx - c$, then $x =$
(A) $\frac{b + c}{b + a}$ (B) $\frac{b + c}{b - a}$ (C) $\frac{b - c}{b - a}$ (D) $\frac{ab + c}{b + a}$ (E) $\frac{ab + c}{b - a}$

12. $\log_3(81) =$
(A) $\frac{1}{4}$ (B) $\frac{1}{3}$ (C) 4 (D) 9 (E) 27

13. Of the following, which best represents the graph of $x^2 + y = 1$?

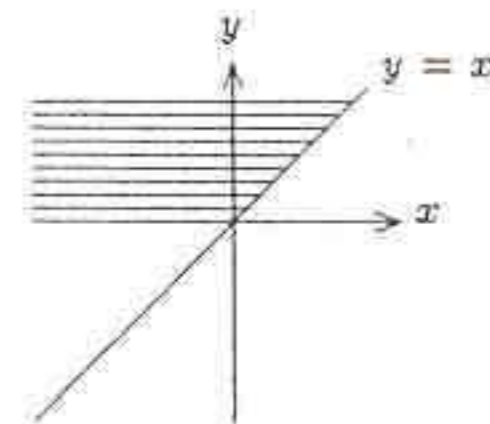


14. One of the solutions of the equation $x^2 + 6x = -13$ is

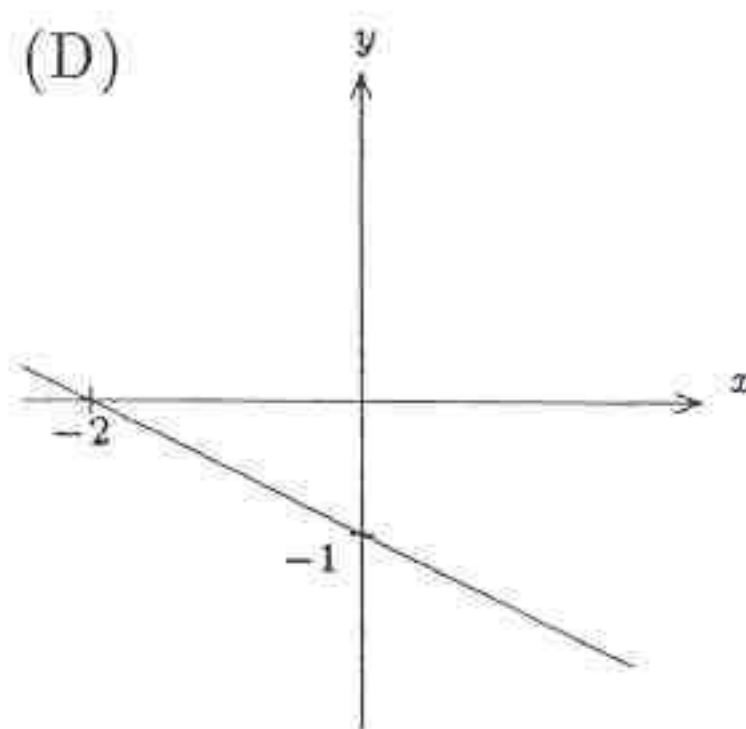
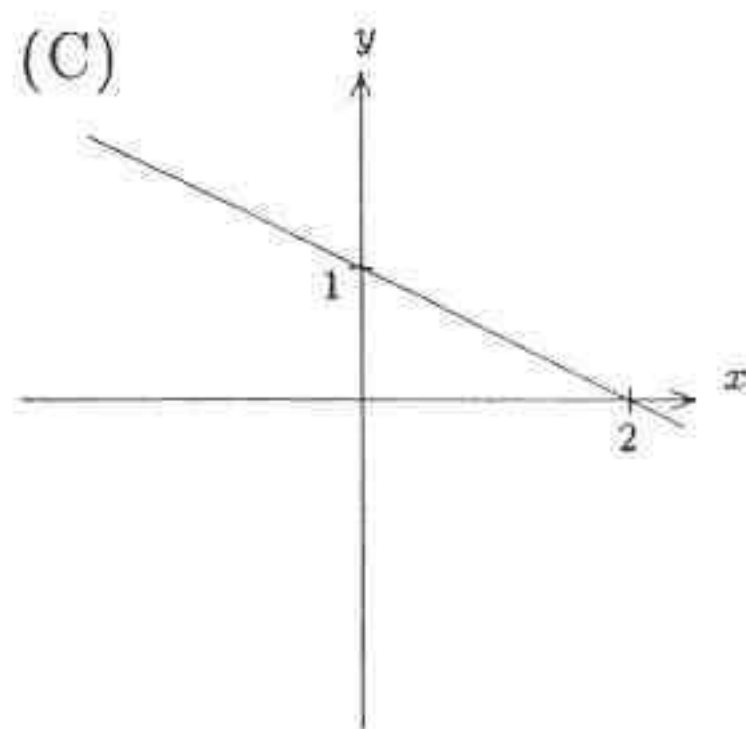
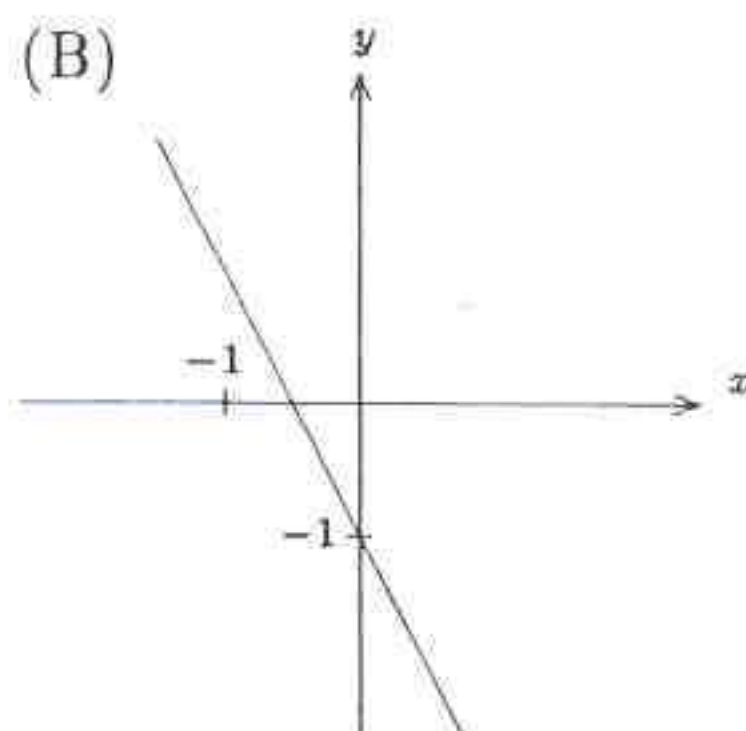
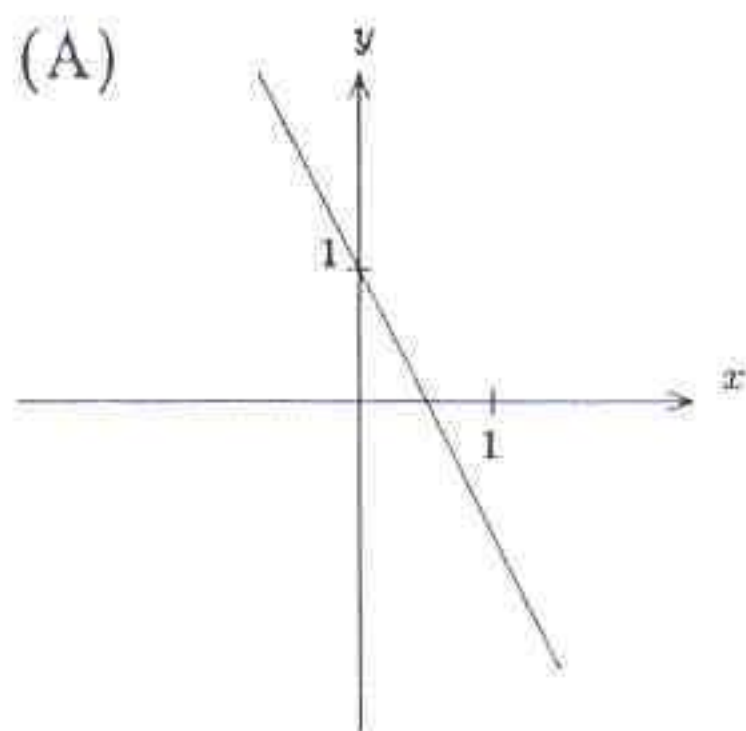
- (A) -19 (B) -13 (C) 3 (D) $2i$ (E) $-3 + 2i$

15. Of the following, which best describes the shaded region shown in the figure to the right?

- (A) $x \geq y$ and $y \leq 0$
(B) $x \leq y$ and $y \leq 0$
(C) $x \geq y$ and $y \geq 0$
(D) $x \leq y$ and $y \geq 0$
(E) $x \leq y$ and $x \leq 0$



16. Of the following, which best represents the graph of $y = 1 - 2x$?



(E) none of the above

17. If $x > 0$ and $y > 0$, then $\sqrt{32\sqrt{4x^8y^{10}}} =$

- (A) $8x^2y^2\sqrt{2y}$ (B) $8x^2y^2\sqrt{y}$ (C) $32x^2y^2\sqrt{y}$ (D) $8x^4y^5\sqrt{2}$ (E) $2x^4y^5$

18. If $7^x = 4$ then $x =$

- (A) $\frac{4}{7}$ (B) $\frac{7}{4}$ (C) $\log_7 4$ (D) $\log_4 7$ (E) $\log_{10} \left(\frac{4}{7}\right)$

19. Which of the following are factors of $w^4 - 16$?

I. $w - 2$ II. $w + 2$ III. $w^2 + 4$

- (A) I only (B) II only (C) III only (D) I and II only
(E) I, II, and III
-

20. The inequality $x^2 - 20x < 21$ is equivalent to

- (A) $3 < x < 7$ (B) $-1 < x < 21$ (C) $-3 < x < 7$ (D) $x < 3$ or $x > 7$
(E) $x < -1$ or $x > 21$
-

21. The graph of the system of equations $\begin{cases} x + 3y = 1 \\ 2x - 6y = 2 \end{cases}$ consists of

- (A) two distinct parallel lines.
(B) one line.
(C) two lines intersecting where $x = 2$.
(D) two lines intersecting where $x = 1$.
(E) two lines intersecting where $y = 1$.
-

22. If $w > 3$ then $|3 - w| =$

- (A) 0 (B) $3 - w$ (C) $3 + w$ (D) $-3 - w$ (E) $-3 + w$
-

23. $\frac{t^3 + 27}{t + 3} =$

- (A) $t^2 - 3t + 9$ (B) $t^2 + 3t + 9$ (C) $t^2 + 6t + 9$ (D) $t^2 + 9$ (E) $t^2 + 24$
-

24. If $f(x) = x^2 - 5$ and $g(x) = 4x + 1$, then $f(g(2)) =$

- (A) 76 (B) 4 (C) -1 (D) -3 (E) -9
-

25. The solution set for the equation $x - 4 - \sqrt{9x} = 0$ consists of

- (A) exactly one negative number.
(B) exactly one positive number.
(C) exactly one positive number and one negative number.
(D) exactly two negative numbers.
(E) exactly two positive numbers.
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