

1. Simplify $\frac{a-4a^3}{a-4a^2+4a^3}$
- A. $\frac{1}{4a^2}$ B. $\frac{1-4a^2}{1-4a+4a^2}$ C. -1 D. $\frac{1+2a}{1-2a}$ E. NOTA
2. Sol is twice as old as Kevin, who is r years old. Lucy is 4 years older than Sol. How old is Lucy?
- A. $2r-4$ B. $r+6$ C. $2r+4$ D. $r-6$ E. NOTA
3. One thousand student-athletes attend a meeting. Nine hundred seventy-three of these students play basketball and 425 play volleyball. At most, how many of the students play only one of these sports?
- A. 548 B. 602 C. 27 D. 575 E. NOTA
4. What is the remainder when $6x^5-3x^4+2x^2-1$ is divided by $x-2$?
- A. -41 B. -153 C. 39 D. 151 E. NOTA
5. Evaluate given $m=5$ and $n=3$: $\frac{(m+2n)^2(m-n)}{2m^2+2m-3n^2}$
- A. $\frac{17}{5}$ B. $\frac{17}{3}$ C. $\frac{22}{3}$ D. $\frac{16}{3}$ E. NOTA
6. If $x^2-4x=9$, find the value of $(x-2)^2$
- A. 1 B. 13 C. 4 D. 9 E. NOTA
7. Solve: $19-4|2-5x|>11$
- A. $0 < x < \frac{4}{5}$ B. $x < -\frac{1}{25}$ or $x > \frac{21}{25}$ C. $x > 0$ D. $x < 0$ or $x > \frac{4}{5}$ E. NOTA
8. Express $\left(\frac{m^2}{n^{-3}}\right)^{-1}\left(\frac{3m^{-2}}{n^{-2}}\right)^{-2}$ in simplest form without negative or zero exponents.
- A. $\frac{9m^2}{n^7}$ B. $\frac{m^2}{9n^7}$ C. $\frac{m^2}{9n}$ D. $\frac{9m^6}{n}$ E. NOTA
9. Write in simplest form: $2\sqrt{18}-5\sqrt{32}+\sqrt{12}$
- A. $2\sqrt{3}+24\sqrt{2}$ B. $-8\sqrt{2}+2\sqrt{3}$ C. $2\sqrt{3}-14\sqrt{2}$ D. $-12\sqrt{2}$ E. NOTA
10. Solve for a : $\frac{5}{4a-4}+\frac{3}{6a-6}-2=\frac{1}{a-1}$
- A. $\frac{4}{13}$ B. $\frac{13}{14}$ C. 1 D. $\frac{11}{8}$ E. NOTA
11. Write as one fraction: $\sqrt{x^2+y^2}+\frac{1}{\sqrt{x^2+y^2}}$
- A. $\frac{x^2+y^2+2(x^2+y^2)+1}{x^2+y^2}$ B. 2 C. $\frac{(x^2+y^2+1)\sqrt{x^2+y^2}}{x^2+y^2}$ D. 1 E. NOTA

12. Suppose you have \$28 in your bank account and you add \$18.25 every week. Your friend has \$161 in his account, and removes \$15 every week. When are your balances the same?
- A. 4 weeks B. 41 weeks C. 5 weeks D. 20 weeks E. NOTA
13. Given: $f(x) = \begin{cases} x^2 - 3x + 2 & \text{if } -8 \leq x < -2 \\ 6 & \text{if } x = -2 \\ |x - 3| - 1 & \text{if } x > -2 \end{cases}$, find $f(-5)$
- A. 7 B. -8 C. 42 D. 12 E. NOTA
14. Write an equation of the line that passes through the points $\left(\frac{1}{2}, -\frac{3}{2}\right)$ and $\left(-\frac{1}{2}, \frac{1}{2}\right)$
- A. $y = -\frac{1}{2}x$ B. $y = -2x - \frac{1}{2}$ C. $y = \frac{1}{2}x + 1$ D. $y = 2x - \frac{5}{2}$ E. NOTA
15. Solve for x: $9^{(x-1)} \bullet 27^{(x+1)} = 3^{(2x-3)}$
- A. $-\frac{3}{2}$ B. $\frac{3}{4}$ C. $\frac{2}{3}$ D. $-\frac{4}{3}$ E. NOTA
16. A total of \$6500 is invested in two funds. One fund pays 4% interest annually and the other fund pays 6% interest annually. The combined annual interest earned is \$350. How much of the \$6500 is invested in the fund that pays 4% annual interest?
- A. \$2000 B. \$2500 C. \$3250 D. \$4000 E. NOTA
17. What is the simplified form of the following complex fraction? $\frac{\frac{10}{x+1}}{\frac{1}{2} + \frac{3}{x+1}}$
- A. $\frac{20x}{x+7}$ B. $\frac{10}{x+7}$ C. $\frac{10(x+7)}{x+1}$ D. $\frac{20}{x+7}$ E. NOTA
18. A real estate broker earns a salary of \$21,000 plus 2.5% of any real estate sold. Last year the broker earned \$52,000. What was the total value of all real estate sold by the broker?
- A. \$12,400,000 B. \$31,000 C. \$1,240,000 D. \$124,000 E. NOTA
19. Which number is *not* a solution of the inequality $-3 \leq -6x + 3 \leq 9$
- A. -1 B. 0 C. $\frac{1}{2}$ D. 1 E. NOTA
20. Four times the smaller of 2 numbers is equal to 3 times the larger. When the larger number is doubled, it exceeds their original sum by 5. Find the larger number.
- A. 35 B. 20 C. 15 D. 5 E. NOTA

21. Find the sum of the roots of the equation $3x^2 + 8x = x^2 - 3x - 12$.

- A. $-\frac{11}{2}$ B. -5 C. $-\frac{7}{2}$ D. $\frac{11}{2}$ E. NOTA

22. Solve $\left|\frac{z}{3} - 9\right| < 6$ for z .

- A. $z > 45$ B. $1 < z < 5$ C. $-9 < z < -45$ D. $9 < z < 45$ E. NOTA

23. The area A , of a circle is directly proportional to the square of the radius, r . If $A = \pi$ when $r = 1$, find A where $r = 2$.

- A. 4 B. $\frac{1}{4}\pi$ C. 2π D. 4π E. NOTA

24. If $f(x) = x^2 - 3x + 1$ and $g(x) = 9 - 2x$, what is $f(g(f(-2)))$?

- A. 11 B. 209 C. -1 D. 229 E. NOTA

25. Solve for x . $\sqrt{4x+5} + 5 = 2x$

- A. 2, 3 B. -2, -3 C. 5, 1 D. 5 E. NOTA

TB 1. Find the number one fourth of the way from $\frac{5}{8}$ to $\frac{3}{2}$.

TB 2. The sum of three consecutive odd integers is 279. What is the difference of the largest and the smallest?

TB 3. State the product of the roots for $f(x) = 2x^2 + 3x - 20$.