1. Evaluate $n^2 p - 2np$ for $n = 3$ and $p = 4$.
   A. 132 B. 12 C. 30 D. 60 E. None of these.

2. $\left(\frac{2}{5} + \frac{1}{4}\right) \div \frac{1}{5} =$
   A. $\frac{5}{3}$ B. $\frac{3}{4}$ C. $\frac{1}{15}$ D. $\frac{13}{4}$ E. $\frac{13}{100}$

3. $-\frac{3}{4} - \frac{2}{5} =$
   A. $\frac{23}{20}$ B. $-\frac{5}{9}$ C. $-\frac{7}{20}$ D. $\frac{1}{9}$ E. None of these.

4. Simplify by combining like terms: $5x - [4 - 3(2x - 8)]$.
   A. $11x - 28$ B. $-x - 12$ C. $-x + 19$ D. $11x + 21$ E. None of these.

5. Simplify, giving your answer in scientific notation: $(3.0 \times 10^{-4})(7.2 \times 10^9)$.
   A. 2.16×10^5 B. 21.6×10^{-5} C. 2.16×10^{-36} D. 2.16×10^6 E. None of these.

6. $\left(\frac{1}{2}x - 5\right)^2 =$
   A. $\frac{1}{4}x^2 + 5x - 25$ B. $\frac{1}{4}x^2 - 5x + 25$ C. $\frac{1}{4}x^2 - \frac{5}{2}x - 25$ D. $\frac{1}{4}x^2 - \frac{5}{2}x + 25$
   E. None of these.

7. The slope of a line passing through the two points $(1, 3)$ and $(3, -2)$ is
   A. $\frac{1}{4}$ B. $\frac{1}{2}$ C. $-\frac{2}{5}$ D. -2 E. None of these.

8. Find the correct equation for the following graph.
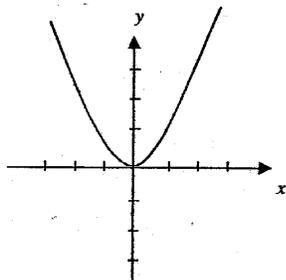
   A. $y = 2x^2 - 1$ B. $y = x$ C. $y = x^2 - 1$ D. $y = x^2$ E. None of these.

9. If $f(x) = \dfrac{2x + 1}{3x - 4}$, find $f(x + 1)$.

   A. $\dfrac{2x + 3}{3x - 1}$ B. $\dfrac{2x + 2}{3x - 3}$ C. $\dfrac{2x + 1}{3x + 1}$ D. $\dfrac{2x^2 + 1}{3x^2 + 1}$ E. None of these.

10. Find the equation of the line, in standard form, having x-intercept 3 and y-intercept -2.
    A. $2x + 3y = 6$ B. $3x - 2y = 5$ C. $2x - 3y = 6$ D. $2x + 3y = 3$ E. None of these.

11. Find a function for the line containing the points $(4, -1)$ and $(2, -2)$.
    A. $f(x) = x - 3$ B. $f(x) = \frac{1}{2}x + 3$ C. $f(x) = 2x - 3$ D. $f(x) = \frac{1}{2}x$ E. None of these.

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12. If $F(x) = 3 - x$ and $G(x) = 2 + x^2$, find $(F \cdot G)(-2)$.
    A. 6 B. 30 C. -30 D. -6 E. None of these.

13. Solve the inequality $3x - 7 > 5x + 6$.
    A. $x < -\frac{13}{2}$ B. $x > -\frac{13}{2}$ C. $x < -\frac{1}{2}$ D. $x > -\frac{1}{2}$ E. None of these.

14. Avis charges $25 per day plus 30 cents per mile to rent a car. National only charges 40 cents per mile. If Joe rents a car for one day, for what number of miles, x, will National be the least expensive?
    A. $x < 25$ B. $x > 25$ C. $x < 250$ D. $x < \frac{55}{40}$ E. None of these.

15. Solve: $|2x + 1| = 5$.
    A. $x = -2$, $x = 2$ B. $x = -2$, $x = 3$ C. $x = 2$ D. $x = -3$, $x = 2$ E. None of these.

16. Solve: $|3x - 7| \geq 5$.
    A. $[\frac{2}{3}, \infty)$ B. $(-\infty, \frac{2}{3}] \cup [4, \infty)$ C. $(-\infty, -4] \cup [\frac{2}{3}, \infty)$ D. $(-\infty, -4] \cup [4, \infty)$
    E. None of these.

17. If y varies inversely as x and $y = 18$ when $x = 6$, find x when $y = 2$.
    A. 54 B. $\frac{1}{54}$ C. $\frac{2}{3}$ D. $\frac{3}{2}$ E. None of these

18. Simplify $\left(\dfrac{a^2 b^{-3}}{a^{-3} b^2} \right)^{-2}$.
    A. $\frac{b}{a}$ B. $(\frac{a}{b})^2$ C. $(\frac{a}{b})^6$ D. $(\frac{b}{a})^{10}$ E. None of these

19. Factor completely: $-8y^3 + 20y^2 + 12y$.
    A. $-4y(2y-3)(y+1)$ B. $-4y(2y+1)(y-3)$ C. $-4y(2y-1)(y+3)$ D. $-4y(2y+3)(y+1)$
    E. None of these.

20. Factor completely: $90ax^2 - 10ay^2$.
    A. $10a(9x^2 - y^2)$ B. $10(ax + y)(ax - y)$ C. $10(9x + y)(9x - y)$ D. $10a(x - y)^2$
    E. None of these.

21. Divide and simplify $\dfrac{x^2 - 2x + 1}{x^2 - 1} \div \dfrac{x^2 - 3x + 2}{x - 2}$.
    A. $\dfrac{(x-1)^2}{x+1}$ B. $\dfrac{1}{x+1}$ C. $\dfrac{x-2}{(x+1)(x+2)}$ D. 1 E. None of these

22. Add and simplify $\dfrac{3ab}{a^2 - b^2} + \dfrac{a - b}{a + b}$.
    A. $\dfrac{a^2 + ab + b^2}{a^2 - b^2}$ B. $\dfrac{a^2 + 3ab - b^2}{a^2 - b^2}$ C. $\dfrac{a + 3ab - b}{a^2 - b^2}$ D. $\dfrac{a^2 - ab - b^2}{a^2 - b^2}$ E. None of these.

23. Combine terms and simplify: $12\sqrt{45} - 8\sqrt{80}$.
    A. $-20\sqrt{5}$ B. $-4\sqrt{35}$ C. $4\sqrt{5}$ D. $8\sqrt{5}$ E. None of these.

24. Simplify: $\sqrt{(x - 16)^{12}}$.
    A. $(x - 16)^{2\sqrt{3}}$ B. $x - \frac{3}{4}$ C. $(x - 16)^6$ D. $(x + 16)^6$ E. None of these.

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25. Multiply and simplify, writing your answer in radical notation: $\sqrt{10}\sqrt{6}$.
    A. $\sqrt{16}$ B. $6\sqrt{10}$ C. $10\sqrt{6}$ D. $2\sqrt{15}$ E. None of these.

26. Solve for x: $\sqrt{3x + 7} = 8$.
    A. $x = \frac{1}{3}$ B. $x = 5$ C. $x = \sqrt{3}$ D. $x = 57$ E. None of these.

27. Solve $A = \frac{1}{2}h(a + b)$ for h.
    A. $h = \dfrac{a + b}{2A}$ B. $h = \dfrac{A}{2(a + b)}$ C. $h = \dfrac{2A}{a + b}$ D. $h = \dfrac{2(a + b)}{A}$ E. None of these.

28. Solve the system of equations for $x : 3x + y = -1$, $x + 2y = 3$.
    A. $x = -2$ B. $x = 2$ C. $x = 1$ D. $x = -1$ E. None of these.

29. Solve for $x : 6x^2 = 42$.
    A. $x = 7$ B. $x = \pm\sqrt{7}$ C. $x = -7$ D. $x = 14$ E. None of these.

30. Solve for $x : 2x^2 - 3x = 2$.
    A. $-\frac{1}{2}$, -2 B. $-\frac{3}{2}$, 2 C. $\frac{3}{2}$, 2 D. $\frac{1}{2}$, -2 E. None of these.

31. Solve for $x : \dfrac{1}{x - 4} - \dfrac{1}{x - 2} = \dfrac{1}{4}$.
    A. $x = 4$, $x = 2$ B. $x = 0$, $x = 2$ C. $x = 0$, $x = 6$ D. $x = 6$, $x = 4$ E. None of these.

32. Rationalize the denominator: $\dfrac{\sqrt{10}}{\sqrt{3x}}$.
    A. 10 B. $\dfrac{\sqrt{30x}}{9x^2}$ C. $\dfrac{\sqrt{30x}}{3x}$ D. $\dfrac{10}{3x}$ E. $\dfrac{\sqrt{10 + 3x}}{9x^2}$

33. One solution of $2x^2 + 2x - 1 = 0$ is:
    A. $-1 - \sqrt{3}$ B. $-2 - \frac{1}{2}\sqrt{3}$ C. $-2 - \sqrt{3}$ D. $\frac{1}{2} - \frac{1}{2}\sqrt{3}$ E. $-\frac{1}{2} - \frac{1}{2}\sqrt{3}$

34. $\left(\frac{1}{8}\right)^{-2/3} =$
    A. $\frac{1}{4}$ B. 4 C. $16\sqrt{2}$ D. $\dfrac{1}{16\sqrt{2}}$ E. None of these.

35. The sum of two positive numbers is $\frac{3}{2}$ and their difference is $\frac{1}{2}$. Find the smaller of the two numbers.
    A. $\frac{1}{2}$ B. $\frac{3}{2}$ C. 1 D. $\frac{1}{4}$ E. None of these.

36. Paul can paint a room in 5 hours. Sally can paint the same room in 3 hours. How long will it take for them to paint the room if they work together?
    A. 4 hours B. $1\frac{7}{8}$ hours C. 3 hours D. $\frac{8}{15}$ hours E. None of these.

37. At 2:00 P.M. two cars start toward each other from towns 240 miles apart. If the rate of one car is 10 mph faster than the other, find the rate of the faster car if the two cars meet at 5:00 P.M.
    A. 45 mph B. 35 mph C. 40 mph D. 30 mph E. None of these.

38. Two investments are made totaling $4800. Part of the money is invested at 8% and the rest at 9%. In the first year, they yield $412 in simple interest. How much money is invested at 8%?

A. $1820 B. $2980 C. $2600 D. $2000 E. None of these.

SOLUTIONS

1. B   2. D   3. E $\left(-\frac{23}{20}\right)$ 4. A   5. D   6. B   7. E $\left(-\frac{5}{2}\right)$ 8. D   9. A   10. C
11. E $\left(y = \frac{1}{2}x - 3\right)$ 12. B;   13. A   14. C   15. D   16. B   17. A   18. D   19. B
20. E $\left[10a(3x + y)(3x - y)\right]$ 21. B   22. A   23. C   24. C   25. D   26. E $(x = 19)$
27. C   28. D   29. B   30. E $\left(x = -\frac{1}{2}, x = 2\right)$ 31. C   32. C   33. E   34. B   35. A
36. B   37. A   39. D;