1. A 40 L solution is 20% acid. How many liters of water must be added to produce a solution that is 15% acid?

   a. $12\frac{2}{3}$ b. 13 c. $13\frac{1}{3}$ d. $13\frac{2}{3}$ e. nota

2. Solve for x: $57 + 2\frac{3}{4}x = 45$

   a. $-4\frac{6}{11}$ b. $-4\frac{4}{11}$ c. $4\frac{4}{11}$ d. $4\frac{6}{11}$ e. nota

3. At a 7-11 store, the subtotal (no tax) for 4 big gulps and six bags of chips is \$7.38. At the same store 6 big gulps and 8 bags of chips cost \$10.54 (no tax). What is the cost of one big gulp?

   a. \$1.00 b. \$1.05 c. \$1.10 d. \$1.15 e. nota

4. The sum of two numbers is 56. The first number is equal to one half of one fourth of the difference of the two numbers. Which of the pairs below could be a solution to this problem?

   a. (5.6, 50.4) b. (5.8, 50.2) c. (6, 50) d. (6.2, 49.8) e. nota

5. If $f(x) = 3x + 2$ and $g(x) = x^2 - 4$. Find $f(g(6))$

   a. 68 b. 78 c. 88 d. 98 e. nota

6. When $6x^4 + 3x^2 + a$ is divided by $x^2 + 2$ the remainder is 25. Find a.

   a. 15 b. 20 c. 25 d. 30 e. nota

7. Divide $\frac{a^5 + a^2b}{ab} \div \frac{a^4 + ab}{ab^2}$

   a. ab b. $\frac{a^5b + ab^2}{a^3 + b}$ c. a^2b d. $\frac{a^4b + a^2b^2}{a^3 + b}$ e. nota

8. Determine the equation of the line that passes through the point (-5, 6) and has a slope of $\frac{7}{8}$.

   a. $y = \frac{7}{8}x + \frac{1}{10}$ b. $y = \frac{7}{8}x + \frac{81}{8}$ c. $y = \frac{7}{8}x + \frac{41}{4}$ d. $y = \frac{7}{8}x + \frac{83}{8}$

9. Evaluate $\frac{s}{4}+r(\frac{2}{3}t)$ if r=5, s=7, and t=6.

a. $21\frac{1}{2}$ b. $21\frac{3}{4}$ c. 22 d. $22\frac{1}{4}$ e. nota

10. A rectangle is 6 inches longer than it is wide. If it is x feet wide, then what is the number of feet in its perimeter?

a. $4x+1$ b. $4x+6$ c. $4x+12$ d. $4x+24$ e. nota

11. Fred can mow the yard in 78 minutes and his brother can mow it in 72 minutes. How long would it take them working together?

a. $37\frac{2}{5}$ b. $37\frac{11}{25}$ c. $37\frac{12}{25}$ d. $37\frac{13}{25}$ e. nota

12. What is the simplest form of $\left(\frac{3}{4}x+\frac{1}{3}\right)\left(\frac{5}{8}x+\frac{2}{5}\right)$

a. $\frac{15}{32}x^2+\frac{61}{100}x+\frac{1}{5}$ b. $\frac{15}{32}x^2+\frac{63}{100}x+\frac{2}{15}$

c. $\frac{13}{32}x^2+\frac{61}{100}x+\frac{2}{15}$ d. $\frac{17}{32}x^2+\frac{61}{100}x+\frac{2}{15}$ e. nota

13. Simplify $\dfrac{1}{\frac{x}{y}-\frac{y}{x}}$

a. $\frac{xy}{x-y}$ b. $\frac{xy}{x^2-y^2}$ c. $\frac{x^2-y^2}{xy}$ d. $\frac{x-y}{xy}$ e. nota

14. What is the simplest form of $(6x+3y)^2$

a. $36(x^2+xy+y)$ b. $9(4x^2+4xy+y^2)$

c. $18(2x^2+2xy+y\ )$ d. $9(4x^2+4xy+y)$ e. nota

15. Factor completely: $x^2 - y^2 + 6x + 9$

a. $(x+3-y)(x+3-y)$ b. $(x+3+y)(x+3+y)$
c. $(x+3+y)(x-3-y)$ d. $(x+3+y)(x+3-y)$ e. nota

16. Solve for x: $\sqrt{9x-5} - \sqrt{4x+20} = 0$

a. 5 b. 6 c. 7 d. 8 e. nota

17. Which property is shown by $x+(y+z) = x+(z+y)$

a. distributive property b. associative property
c. substitution property d. commutative property e. nota

18. Solve $3x^2 + 2x = 4$

a. $\frac{-1\pm\sqrt{13}}{3}$ b. $\frac{-2\pm2\sqrt{13}}{3}$ c. $-1\pm\sqrt{13}$ d. $-2\pm2\sqrt{13}$ e. nota

19. Solve for x with $(x \in \Re)$ $|x^2 + 2x + 1| < -4$

a. (0) b. ∞ c. $\Re$ d. $\varnothing$ e. nota

20. Find the greatest common factor of 84 and 126.

a. 2 b. 21 c. 42 d. 63 e. nota

21. Simplify 10% of 20% of 30% of 40% of 50% of 20,000

a. 24 b. 26 c. 28 d. 30 e. nota

22. What is the length of a diagonal of a rectangle whose length is 6m and whose width is 4m?

a. $\sqrt{13}$ b. $2\sqrt{13}$ c. $3\sqrt{13}$ d. $4\sqrt{13}$ e. nota

23. Baily walks to the store at 5km/h and returns by car at 50km/h. If the car trip is 36 minutes shorter than the time it takes to walk, how far did she walk.

a. $2\frac{1}{3}$ b. $2\frac{2}{3}$ c. 3 d. $3\frac{1}{3}$ e. nota

24. Find the least common multiple of 48 and 64.

a. 128 b. 144 c. 192 d. 256 e. nota

25. Determine the equation of the line passing through points (1, 3) and (5, 4).

a. $y = 4x + 2\frac{3}{4}$ b. $y = \frac{1}{4}x + 2\frac{3}{4}$

c. $y = \frac{1}{4}x + \frac{3}{4}$ d. $y = 4x + 2\frac{3}{4}$ e. nota

26. What is the probability of rolling an even number greater than 18 on three fair six sided dice?

a. 0 b. $\frac{1}{6}$ c. $\frac{1}{3}$ d. $\frac{2}{3}$ e. nota

27. Max can change 5 tires in 22 minutes. At this rate how long will it take him to change 8 identical tires?

a. 35 b. 35.4 c. 35.8 d. 36.2 e. nota

28. If $36x^2y + 48x^3y^2 = 12x^2y(A + B)$ then:

a. $(A = 4, B = 4xy)$ b. $(A = 3, B = 3xy)$

c. $(A = 3, B = 4x^2y)$ d. $(A = 3, B = 4xy)$ e. nota

29. A garden is 10 feet by 15 feet. A sidewalk of equal width is added around the edge which adds 84 square feet to the area of the garden. What are the new dimensions of the garden?

a. 12×19.5 b. 12.5×17.5 c. 12.5×18.72 d. 12.5×18.72 e. nota

30. Simplify: $[-5 + 7(5 + 2)] \div [8 \div 2(20 \div (10 + 15 \times 2))]$

a. 5 b. 5.5 c. 6 d. 6.5 e. nota