

1.  $\sqrt{\frac{9}{25}} =$

- a)  $\frac{3}{25}$                       b)  $\frac{4.5}{12.5}$                       c)  $\frac{2}{9}$                       d)  $\frac{3}{5}$                       e)  $\frac{9}{5}$

2.  $4\sqrt{3} \times 3\sqrt{3} =$

- a)  $7\sqrt{3}$                       b)  $12\sqrt{3}$                       c) 36                      d) 72                      e) 108

3. Simplify:  $\sqrt{18}(\sqrt{2} - \sqrt{3})$

- a)  $-3\sqrt{2}$                       b)  $\sqrt{36} - \sqrt{54}$                       c)  $6 - 3\sqrt{6}$                       d)  $3\sqrt{2}$                       e) 18

4. Simplify:  $\frac{\sqrt{6}}{\sqrt{5}}$

- a)  $\frac{\sqrt{11}}{5}$                       b)  $\frac{\sqrt{30}}{5}$                       c)  $\sqrt{30}$                       d)  $5\sqrt{6}$                       e)  $6\sqrt{5}$

5. When the denominator of  $\frac{3 + \sqrt{5}}{6 + \sqrt{5}}$  is rationalized and reduced, the expression can be written in the form  $\frac{A + B\sqrt{C}}{D}$ . What is the value of  $B$ ?

- a) -9                      b) -3                      c) 3                      d) 9                      e) 13

6. Write  $2\sqrt{5}$  as a complete radical.

- a)  $\sqrt{20}$                       b)  $\sqrt{27}$                       c)  $\sqrt{29}$                       d)  $\sqrt{40}$                       e)  $\sqrt{50}$

7.  $\sqrt{18} + \sqrt{8} - \sqrt{32} =$

- a)  $-\sqrt{6}$                       b)  $\sqrt{-6}$                       c)  $\sqrt{2}$                       d)  $\sqrt{6}$                       e)  $4\sqrt{2}$

8. Write  $2^{5/7}$  in radical form.

- a)  $\sqrt[35]{2}$       b)  $\sqrt[12]{2}$       c)  $\sqrt[7]{2^5}$       d)  $\sqrt[5]{2^7}$       e)  $\sqrt[7]{2^{10}}$

9. Evaluate:  $2^{-1} + 5^{-1}$

- a)  $-7$       b)  $-\frac{1}{7}$       c)  $\frac{1}{7}$       d)  $\frac{7}{10}$       e)  $\frac{10}{7}$

10. Simplify and rewrite using only positive exponents:  $\left(\frac{x^{-2}}{y^3}\right)^{-3}$

- a)  $\frac{1}{x^6}$       b)  $\frac{y^9}{x^6}$       c)  $\frac{y^6}{x^5}$       d)  $y^9$       e)  $x^6y^9$

11. Solve for  $x$  given  $4^{2x+2} = 8^{1-2x}$ .

- a)  $-4$       b)  $-\frac{1}{10}$       c)  $-\frac{7}{8}$       d)  $\frac{1}{4}$       e)  $4$

12. Factor:  $2x^2 + x - 15$

- a)  $(2x - 3)(x + 5)$       b)  $(2x - 5)(x + 3)$       c)  $(2x + 3)(x - 5)$       d)  $(2x + 5)(x - 3)$       e)  $(2x - 1)(x - 15)$

13. Factor:  $x^2 - 81$

- a)  $(x - 9)(x - 9)$       b)  $(x + 81)(x - 1)$       c)  $(x - 81)(x + 1)$       d)  $(x + 9)(x - 9)$       e)  $x(x - 81)$

14. Factor completely:  $6a^2 - 48ab + 96b^2$

- a)  $6(a + 2b)(a - 2b)$       b)  $(3a - 4b)(2a - 4b)$       c)  $(6a - 4b)^2$   
d)  $6(a - 4b)^2$       e)  $(6a - 2b)(a - 8b)$

15. For what values of  $x$  is the following expression undefined?

$$\frac{x^2 + 9x + 14}{x^2 - 6x - 16}$$

- a)  $2$  and  $-8$  only      b)  $-8$  only      c)  $2$  only      d)  $-8, 2$  and  $7$       e)  $-2$  and  $8$

16. Simplify:  $\frac{x^2 + x - 12}{x^2 - 2x - 24}$
- a)  $\frac{(x-4)(x+3)}{(x+4)(x-6)}$     b)  $\frac{1}{2}$     c)  $\frac{x+4}{x-6}$     d)  $\frac{x+3}{x+6}$     e)  $\frac{x-3}{x-6}$
17. Simplify:  $\frac{x^2 - 2x - 24}{x-3} \div \frac{x+4}{x-3}$
- a)  $\frac{(x-4)(x+6)}{(x+4)}$     b)  $\frac{1}{x-6}$     c)  $\frac{(x-6)(x+4)^2}{(x-3)^2}$     d)  $6-x$     e)  $x-6$
18. Simplify:  $\frac{4x+3}{4} - \frac{3x-2}{5}$
- a)  $\frac{2x+17}{5}$     b)  $\frac{2x+1}{5}$     c)  $\frac{8x+7}{20}$     d)  $\frac{x+5}{20}$     e)  $\frac{8x+23}{20}$
19. Simplify:  $\frac{9}{x+5} + \frac{2x-3}{25-x^2}$
- a)  $\frac{-7x+42}{x^2-25}$     b)  $\frac{7x-48}{x^2-25}$     c)  $\frac{7x-42}{x^2-25}$     d)  $7x-42$     e)  $\frac{7x+48}{x^2-25}$
20. A school play offered student tickets at \$4.00 each and adult tickets at \$6.00 each. Opening night 700 people attended and the total amount of money collected was \$3 730.00. How many students attended?
- a) 235    b) 275    c) 455    d) 465    e) 470
21. Given three consecutive positive integers it turns out that the sum of the squares of the two smaller numbers is 45 more than the square of the largest number. What is the *sum* of the three numbers?
- a) 18    b) 21    c) 24    d) 27    e) 30
22. Solve:  $\frac{5}{6x} = 7 + \frac{2}{x}$
- a) -7    b) -6    c)  $-\frac{1}{6}$     d)  $\frac{1}{6}$     e) 6
23. Solve:  $\frac{2x}{x+1} - \frac{2x^2+1}{x^2-1} = \frac{3}{1-x}$
- a) -2    b)  $-\frac{1}{2}$     c)  $\frac{1}{2}$     d) 2    e) 4

**Answer List**

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|-------|-------|-------|
| 1. d  | 2. c  | 3. c  |
| 4. b  | 5. c  | 6. a  |
| 7. c  | 8. c  | 9. d  |
| 10. e | 11. b | 12. b |
| 13. d | 14. d | 15. e |
| 16. e | 17. e | 18. e |
| 19. c | 20. a | 21. d |
| 22. c | 23. a |       |