

1. Simplify each of the following expressions.

(a) $\frac{3}{x+1} - \frac{2}{x-1} + \frac{x+3}{x^2-1} =$

(b) $\frac{a^2 - 8a + 16}{a} \cdot \frac{a^3}{4-a} =$

(c) $\frac{2x^2 - 98}{x^2 - 6x - 7} \div \frac{21 + 3x}{6x^2 - 6} =$

2. Completely factor each of the following expressions.

(a) $24a^3 - 315a^2 + 3a^4 =$

(b) $2x^4y^3 - 32y^3 =$

3. Solve each of the following equations. Make sure to check your solution.

(a) $2(x-3) + 5(4x+3) = 20x - 1$

(b) $3(2x-5) - 2(1-5x) - 2x = 7(2x-3) + 4$

(c) $|3x-2| + 7 = 4$

(d) $|5x+1| - 2 = 7$

4. Consider the rectangle with sides 8 inches and 13 inches long.

(a) Find the perimeter of the rectangle. Include units in your answer.

(b) Find the area of the rectangle. Include units in your answer.

5. We threw an object upward from the top of a 880 ft tall building. t seconds after we dropped it, the distance of the object from the ground is

$$h(t) = -16t^2 + 96t + 880$$

(a) Find $h(t)$ if $t = 5$ s. (Also denoted by $h(5$ s)).

(b) Find $h(t)$ if $t = 7$ s. (Also denoted by $h(7$ s)).

(c) How long until the object hits the ground?

6. A coat went on an 18% sale. The sale price is \$ 328. Find the original price.

7. Sally got a 6% raise. Now she is making \$ 2650 per month. How much was she making before the raise?

MULTIPLE CHOICE QUESTIONS

8. Find all solutions of the equation. $|2x - 3| = 11$

(a) 4, 7

(b) 4

(c) -4, 7

(d) -7, 7

9. Simplify the expression $\frac{3ax - 6ay - bx + 2by}{3a - b}$
- (a) $2x - 4y$
 - (b) $x - 2y$
 - (c) $ax - 6y - x + by$
 - (d) $-6ay + 2by$
10. Solve the equation. $x + 1 = 9x^3 + 9x^2$
- (a) $-3, -1, 3$
 - (b) $-1, -\frac{1}{3}, \frac{1}{3}$
 - (c) 0
 - (d) $-1, 0, 1$
11. Solve the following equation. $x^3 = 4x$
- (a) $-2, 0, 2$
 - (b) $-2, 2$
 - (c) 2
 - (d) $0, 4$
12. Solve the following equation. $2x^2 + 5x = 3$
- (a) $-3, \frac{1}{2}$
 - (b) -3
 - (c) $-3, 2$
 - (d) $-\frac{3}{2}, -1$
13. Simplify the expression $\left(\frac{2}{3} - 3\frac{1}{5}\left(-\frac{7}{8}\right)\right) \div \left(2\frac{3}{5}\right) - \frac{1}{3} =$
- (a) $-\frac{15}{13}$
 - (b) $\frac{27}{52}$
 - (c) $\frac{2}{3}$
 - (d) 1
14. Perform the operation: $(5x - 2)^2 =$
- (a) $25x^2 - 20x + 4$
 - (b) $25x^2 - 4$

(c) $20x^2 - 50x + 4$

(d) $25x^2 + 20x + 4$

15. Simplify: $(25m^2 - 9) \left(\frac{5m + 3}{5m - 3} \right)$

(a) $(5m + 3)^2$

(b) 1

(c) $5m - 3$

(d) $5(5m + 3)$

16. Solve:

$$\begin{aligned} 5x + y &= 25 \\ x &= y - 7 \end{aligned}$$

(a) $x = 2$ and $y = 15$

(b) $x = 3$ and $y = 10$

(c) $x = 5$ and $y = 12$

(d) $x = 10$ and $y = -25$

17. Evaluate the expression $\frac{|x - 6|}{6 - x}$ when $x = -3$.

(a) 3

(b) -1

(c) -3

(d) 1

18. Multiply and simplify by combining like terms: $(a + 5)(a^2 - 5a + 25) =$

(a) $a^3 - 25a^2 - 25a + 125$

(b) $a^3 + 125$

(c) $a^3 - 5a^2 - 25a + 125$

(d) $a^3 - 125$

19. Evaluate the following expression: $4(3 - 7) \div 2 + 8 =$

(a) -1.6

(b) 0

(c) 10.5

(d) undefined

20. Factor completely $x^2 - 4x - 12$.

- (a) $(x + 6)(x - 2)$
- (b) $(x - 8)(x + 4)$
- (c) $(x - 2)(x - 6)$
- (d) $(x - 6)(x + 2)$

21. Find the indicated product and simplify by combining like terms: $(7m + 3n)(7m - 3n)$

- (a) $49m^2 - 21mn - 9n^2$
- (b) $49m^2 - 9n^2$
- (c) $49m^2 - 42mn - 9n^2$
- (d) $7m^2 - 3n^2$

22. When $t = -5\frac{1}{2}$, then the expression $-8t - t^2 + \frac{1}{4}$ has value

- (a) -74
- (b) $\frac{149}{2}$
- (c) 74
- (d) 14

23. Solve: $-6(t + 3) + 2(5 - t) = -9$

- (a) $\frac{11}{8}$
- (b) $\frac{17}{8}$
- (c) $\frac{22}{7}$
- (d) $\frac{1}{8}$

24. Multiply: $(-8x^2y)(-3xy^4)$

- (a) $24x^3y^5$
- (b) $-11x^2y^5$
- (c) $-24x^2y^4$
- (d) $11x^3y^3$

25. Subtract: $(4a^4 - 5a^2 + 2a + 5) - (3a^3 - 3a^2 + 2a - 3)$.

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