

1. Add. $\frac{3}{3} \cdot \frac{1}{8} + \frac{5}{6} \cdot \frac{4}{4}$ LCD = 24

$$\frac{3}{24} + \frac{20}{24}$$

$$\frac{23}{24}$$

2. Simplify. $-\left(\frac{5}{6} + \frac{4}{5}\right)$ LCD = 30

$$-\left(\frac{25}{30} + \frac{24}{30}\right)$$

$$-\frac{49}{30}$$

3. Which property of the real numbers is illustrated by the following statement?
 $y + (-y) = 0$

Inverse of Addition

4. Which property of the real numbers is illustrated by the following statement?
 $6(xy + z) = 6xy + 6z$

Distribution

Use the following to answer questions 5 - 6.

$$S = \left\{-5, -\frac{3}{4}, 3.25, -\sqrt{3}, -0.8, \pi, \frac{9}{2}, \sqrt{36}\right\}$$

5. List the subset of S consisting of integers.

$$\{-5, \sqrt{36}\}$$

6. List the subset of S consisting of irrational numbers.

$$\{-\sqrt{3}, \pi\}$$

7. Evaluate. $(-10)^{-2}$

$$\frac{1}{(-10)^2} = \frac{1}{100}$$

8. Evaluate. $\left(\frac{1}{8}\right)^{-1} = 8$

9. Simplify and express your answer using positive exponents only.

$$(5m^9)(4m^{10})(3m^{-2})$$

$$60m^{9+10-2} = 60m^{17}$$

10. Simplify. $(a^7b^3)^7$

$$a^{49}b^{21}$$

11. Write in rational exponent form.

Do not simplify.

$$\sqrt[3]{x^2} = x^{2/3}$$

12. Write in rational exponent form.

Do not simplify.

$$-\sqrt{195} = -195^{1/2}$$

13. Simplify. $\sqrt[5]{243a^{25}b^5}$
 $3a^5b$



14. Simplify. $\sqrt{3y}\sqrt{27xy}$
 $\sqrt{3y} \cdot 3\sqrt{3xy}$
 $9y\sqrt{x}$



15. Rationalize the denominator

and simplify. $\frac{14x}{\sqrt{23x}} \cdot \frac{\sqrt{23x}}{\sqrt{23x}}$

$$\frac{14x\sqrt{23x}}{23x}$$

$$\frac{14\sqrt{23x}}{23}$$

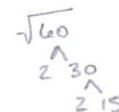
16. Rationalize the denominator and

simplify. $\frac{\sqrt{10}-\sqrt{6}}{\sqrt{10}+\sqrt{6}} \cdot \frac{\sqrt{10}-\sqrt{6}}{\sqrt{10}-\sqrt{6}}$

$$\frac{10 - \sqrt{60} - \sqrt{60} + 6}{10 + \sqrt{60} - \sqrt{60} - 6}$$

$$\frac{16 - 2\sqrt{60}}{10 - 6}$$

$$\frac{16 - 2\sqrt{15}}{4} = \frac{8 - \sqrt{15}}{2}$$



17. Add $6p^4 - p^2 - 4$ and $9p^3 - 2$.

$$6p^4 + 9p^3 - p^2 - 6$$

18. Subtract $a^3 + 2a^2 + 9a + 1$ from $a^4 + 9a^2 - a + 2$.

$$\begin{array}{r} a^4 + 0a^3 + 9a^2 - a + 2 \\ - (a^3 + 2a^2 + 9a + 1) \\ \hline a^4 - a^2 + 7a^2 - 10a + 1 \end{array}$$

19. Multiply. $(5m - 3)(4m + 7)$

$$20m^2 + 35m - 12m - 21$$

$$20m^2 + 22m - 21$$

20. Multiply and simplify.

$$(3x^2 - 2x - 1)(x^2 + x + 5)$$

$$3x^4 - 2x^3 - x^2 + 3x^3 - 2x^2 - 5 + 15x^2 - 10x - 5$$

$$3x^4 + x^3 + 12x^2 - 10x - 5$$

21. Factor completely.

$$(2x^2 - 4xy)(-3xy + 6y^2)$$

$$2x(x - 2y) - 3y(x - 2y)$$

$$(2x - 3y)(x - 2y)$$

22. Factor completely.

$$6m^2 - mn - 12n^2$$

$$(3m + 4n)(2m - 3n)$$

23. Factor completely.

$$4a^2 - 9b^2$$

$$(2a + 3b)(2a - 3b)$$

24. Factor completely.

$$16x^2y - 8xy + y$$

$$y(16x^2 - 8x + 1)$$

$$y(4x - 1)^2$$

25. Perform the indicated operations and reduce to lowest terms.

$$\frac{x^2 - 1}{y^2} \cdot \frac{y^2}{\frac{x}{y} + 1}$$

$$\frac{x^2 - y^2}{xy + y^2} = \frac{(x+y)(x-y)}{y(x+y)} = \frac{x-y}{y}$$

$$\frac{\frac{x^2}{y^2} - \frac{y^2}{y^2}}{\frac{x}{y} + \frac{y}{y}} = \frac{\frac{x^2 - y^2}{y^2}}{\frac{x+y}{y}} = \frac{x^2 - y^2}{y^2} \cdot \frac{y}{x+y} = \frac{x^2 - y^2}{x^2} \cdot \frac{y}{x+y} = \frac{(x+y)(x-y)}{y(x+y)} = \frac{x-y}{y}$$

26. Add and write the result in lowest terms.

$$\frac{x}{x^2 - 9x + 18} + \frac{x-8}{x-6} + \frac{x+4}{x-3}$$

$$(x-6)(x-3)$$

$$\frac{x}{(x-6)(x-3)} + \frac{x-8}{x-6} \cdot \frac{x-3}{x-3} + \frac{x+4}{x-3} \cdot \frac{x-6}{x-6}$$

$$\frac{x + (x^2 - 8x - 3x + 24) + (x^2 + 4x - 6x - 24)}{(x-6)(x-3)}$$

$$\frac{x + 2x^2 - 13x}{(x-6)(x-3)} \rightarrow \frac{2x^2 - 12x}{(x-6)(x-3)} \rightarrow \frac{2x(x-6)}{(x-6)(x-3)} = \frac{2x}{x-3}$$

27. Reduce to lowest terms.

$$\frac{36a^{13}b^2}{6a^7b^8}$$

$$\frac{6a^6}{b^6}$$

28. Solve. $4(x-2) + 6x = 12$

$$4x - 8 + 6x = 12$$

$$10x = 20$$

$$x = 2$$