

1. Factor completely.

(a). $2x^3y + 2xy - 3x^2 - 3$ [Grouping] (b). $2x^3 - 8x$ (c). $x^2 + 3x - 4$

(d). $3x^2 - 10x + 8$ (e). $x^4 + 12x^2 + 36$ (f). $6x^2 + 11x + 4$

2. Use one of the factorization formulas involving cubes to factor $8x^3 + 1$

3. Determine the missing factor: $3x^{1/2} + 6x^{5/2} = 3x^{1/2}(?)$

4. Perform the indicated operations and simplify.

(a). $\frac{3x+9}{x^2-9} \cdot \frac{x^2-6x+9}{9}$ (b). $\frac{x^2+4x+3}{1-x^2} \div (x^2-x-12)$

(c). $\frac{1-2a}{4a} - \frac{a+1}{4a}$ (d). $\frac{4}{3} + \frac{2x+1}{4}$

(e). $\frac{x}{x+2} - \frac{x+2}{x^2-4} + 3$ (f). $\frac{3a^2bc^4}{8a^3b^2c^5} \div \frac{2abc}{a^2b^3c^2}$

5. Simplify the complex fractions

(a). $\frac{\frac{3}{2y} + 2}{\frac{2}{3y} + \frac{1}{5y^2}}$ (b). $\frac{\frac{2}{x+1} - \frac{1}{x-1}}{x+1 + \frac{2}{x-1}}$ (c). $\frac{\frac{x}{\sqrt{y}} + \sqrt{y}}{x+y}$

6. Rewrite the following so that only positive exponents remain and simplify [No calculator]. $(4^{-1} - 2^{-3})^{-1}$

7. Solve the following equations for x .

(a). $2(x+3) + 4x = 3(x-1)$ (b). $3(x-2) = 6x-6$

(c). $\frac{3x}{4} + 2 = \frac{2x-1}{5}$ (d). $\frac{2}{3} - \frac{1}{x} = \frac{6}{5x}$ [Check your answer.]

8. Solve for y in terms of x : $2x + \frac{3}{2}y = 8$

9. A company manufactures and sells highlighter markers. The total cost and revenue (in dollars) for x packages of markers is given below. How many packages of markers must they sell to break even?

Total Cost = $3x + 586$ and Total Revenue = $15x$.

10. In seawater, the pressure p is related to the depth d according to $33p - 18d = 495$ where p is in pounds per square inch and d is in feet.

The Titanic was discovered at a depth of 12,460 ft. Find the pressure at this depth.

11. If $f(x) = 3x - 4$, find the following

(a). $f(3)$ (b). $f\left(\frac{1}{4}\right)$ (c). $f(2.3)$ (d). $f(x+h) - f(x)$

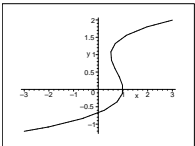
12. If $f(x) = -2x^2 + 5$, find the following

(a). $f(0)$ (b). $f(-2)$ (c). $f(x-1)$ (d). $f(x) - f(1)$

13.

(a). Does the graph represent y as a function of x ? Explain.

(b). If $y = 4x^3$, is y a function of x ?



14. Find the domain and range for

(a). $f(x) = \sqrt{x+9}$ (b). $y = x^2 + 3$ (c). $f(x) = \frac{x}{3x+5}$ [Domain only]

15. Given $f(x) = \sqrt{x}$ and $g(x) = \frac{2}{\sqrt{x}}$, find and simplify

(a). $(f+g)(x)$ (b). $\left(\frac{f}{g}\right)(x)$ (c). $f^2(x) = (f \cdot f)(x)$

16. Given $f(x) = \frac{1}{2x}$ and $g(x) = 1 - 3x$, find and simplify

(a). $(f \cdot g)(x)$ (b). $(f \circ g)(x)$ (c). $(g \circ g)(x)$

17. The phone company charges \$72 for the service call, plus \$48 per hour. Let x be the number of hours they work.

(a). Write an expression for the dollars you pay for x hours.

(b). How much is the bill, if they work half an hour?

(c). How long did they work if the bill was \$154.80 ?