

Simplify.

1. $\frac{5}{b^2 - 16} + \frac{3}{4 - b} + \frac{7}{b + 4}$

2. $\frac{5}{3x - 15} + \frac{4x}{x^2 - 25}$

3. $\frac{1 + \frac{2}{x + 1}}{x + \frac{x - 2}{x}}$

4. $\frac{1 + \frac{1}{x}}{1 - \frac{1}{x^2}}$

5. $\left(\frac{x^3 + 1}{6x}\right)\left(\frac{x + 1}{2x}\right)^{-1}$

6. $\left(\frac{x^2 - 16}{27x^3 - 8}\right)\left(\frac{x + 4}{3x - 2}\right)^{-1}$

7. $-2\sqrt[4]{96} - 5\sqrt[4]{486}$

8. $9\sqrt[5]{64} + 2\sqrt[5]{486}$

9. $\frac{2}{\sqrt[3]{3}}$

10. $\frac{10}{\sqrt[3]{25}}$

11. $\sqrt[3]{\sqrt[4]{64}}$

$$12. \sqrt{\sqrt{81a^{12}b^{16}}}$$

$$13. \frac{9 - \sqrt{2}}{9 + \sqrt{2}}$$

$$14. \frac{2 - 4i\sqrt{3}}{3 + i\sqrt{3}}$$

$$15. \left(2^{-1} + \frac{2^{-1}}{3^{-1}}\right)^{-1}$$

$$16. \frac{1}{2^{-1} + 4^{-1}}$$

$$17. \frac{19}{3c^2 - 6c} = \frac{1}{3c} + \frac{2}{c - 2}$$

$$18. \frac{3x}{2x - 5} - \frac{5}{3x + 1} = \frac{3}{2}$$

$$19. 3 = a + \sqrt{a - 1}$$

$$20. \sqrt{3p + 13} = 2p - 3$$

$$21. (3x - 3)^{\frac{2}{3}} = 9$$

$$22. (m^2 - 1)^{\frac{2}{3}} = 16$$

$$23. \text{Find the inverse: } f(x) = \frac{2x^2 - 1}{9}$$

$$24. \text{Find the inverse: } h(x) = \frac{3x}{7x - 10}$$

25. Graph: $y = 2x(x - 1)^2$

26. Graph: $y = x^2(x + 5)$

27. If the graph of $y = x^2$ is translated 5 units to the right and 2 units down, what is its equation?

28. Consider the graph of $y = x^2$. It is slid 2 units to the right, then reflected in the x -axis, and finally slid 3 units up. What is the resulting equation?

29. Graph $f(x) = \begin{cases} -2 & \text{if } x < 0, \\ 1 & \text{if } x = 0, \\ x & \text{if } x > 0, \end{cases}$

30. Graph $f(x) = \begin{cases} -x^2 & \text{if } x < 0, \\ 2 & \text{if } x = 0, \\ 3x - 1 & \text{if } x > 0, \end{cases}$

31. Put the following in the form $a(x - h)^2 + k$.

a) $y = 2x^2 - 24x + 69$

b) $y = -x^2 + 6x - 8$

c) $y = 3x^2 - 3x + \frac{23}{4}$

32. Put the following in the form $a(x - h)^2 + k$.

a) $y = 2x^2 - 20x + 41$

b) $y = -x^2 + 14x - 46$

c) $y = 3x^2 - 2x + \frac{22}{3}$

33. Find all rational roots of $x^3 - 7x - 6 = 0$.

34. Find all rational roots of $x^3 - 7x^2 + 7x + 15 = 0$.

35. Solve: $a^3 + 6a^2 + 5a - 12 \leq 0$

36. Solve: $4x^3 + 20x^2 - 9x - 45 \geq 0$

37. Find the vertex of the parabola
 $y = 3x^2 + 18x + 19$

38. Find the vertex of the parabola
 $y = -6x^2 + 24x - 15$

39. Given $g(x) = x^2 - 10$ and $h(x) = 3x - 8$,
find $g(h(x))$

40. Given $f(x) = 2x + 5$ and $g(x) = x^2 - 3x - 10$,
find $g(f(x))$

41. State the vertical and horizontal asymptotes:

$$p(x) = \frac{4 - x^2}{x^2 - 2x - 15}$$

42. State the vertical and horizontal asymptotes:

$$f(x) = \frac{2x^2 + x - 1}{x^2 + x - 12}$$

43. Tell if the function is symmetric with respect to the x-axis, y-axis, and origin.

$$10x^2 + 3y^2 = 15$$

44. Tell if the function is symmetric with respect to the x-axis, y-axis, and origin.

$$8y^2 = 2xy + 7$$

45. $(2x^4 - 3x^3 - x + 2) \div (2x + 1)$

46. $(4c^4 - 17c^3 + 8c^2 + 23c - 10) \div (4c - 1)$

47. Factor: $x^2(x^2 + 1)^{-5} - (x^2 + 1)^{-4}$

48. Factor: $2x(x - 5)^{-3} - 4x^2(x - 5)^{-4}$

49. Factor: $2x(x - 1)^{1/2} - 5(x - 1)^{-1/2}$

50. Factor: $4(2x - 1)^{3/2} - 2x(2x - 1)^{1/2}$

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| <p>1.
 Answer: $\frac{4b-35}{(b-4)(b+4)}$
 CodePath: TRI.AE.201</p> <p>2.
 Answer: $\frac{17x+25}{3(x+5)(x-5)}$
 CodePath: CA2.CG.42</p> <p>3.
 Answer: $\frac{x^2+3x}{(x+1)(x^2+x-2)}$
 CodePath: TRI.AE.230</p> <p>4.
 Answer: $\frac{x}{x-1}$
 CodePath: EAS.NY1.3.H.A.59</p> <p>5.
 Answer: $\left(\frac{x^2-x+1}{3}\right)$
 CodePath: TRI.AA.138</p> <p>6.
 Answer: $\frac{x-4}{9x^2+6x+4}$
 CodePath: TRI.AA.139</p> <p>7.
 Answer: $-19\sqrt[4]{6}$
 CodePath: TRI.BE.59</p> <p>8.
 Answer: $24\sqrt[5]{2}$
 CodePath: TRI.BE.60</p> <p>9.
 Answer: $\frac{2\sqrt[3]{9}}{3}$
 CodePath: TRI.BD.91</p> <p>10.
 Answer: $2\sqrt[3]{5}$
 CodePath: TRI.BD.94</p> <p>11.
 Answer: $\sqrt{2}$
 CodePath: TRI.BD.95</p> <p>12.
 Answer: $3a^3b^4$
 CodePath: TRI.BB.102</p> <p>13.
 Answer: $\frac{83-18\sqrt{2}}{79}$
 CodePath: TRI.BF.51</p> | <p>14.
 Answer: $\frac{-3-7\sqrt{3}i}{6}$
 CodePath: CA2.CF.52</p> <p>15.
 Answer: $\frac{1}{2}$
 CodePath: TRI.AA.128</p> <p>16.
 Answer: $\frac{4}{3}$
 CodePath: TRI.AA.125</p> <p>17.
 Answer: 3
 CodePath: TRI.AG.53</p> <p>18.
 Answer: $x = -\frac{13}{5}$
 CodePath: CM1.CE.18</p> <p>19.
 Answer: 2
 CodePath: TRI.BJ.115</p> <p>20.
 Answer: 4
 CodePath: TRI.BJ.121</p> <p>21.
 Answer: 10, -8
 CodePath: TRI.BJ.174</p> <p>22.
 Answer: $\pm\sqrt{65}$
 CodePath: TRI.BJ.175</p> <p>23.
 Answer: $\pm\sqrt{\frac{9x+1}{2}}$
 CodePath: TRI.HC.36</p> <p>24.
 Answer: $\frac{10x}{7x-3}$
 CodePath: TRI.HC.59</p> <p>25.
 Answer:
 CodePath: TRI.IB.35</p> <p>26.
 Answer:
 CodePath: TRI.IB.38</p> |
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27.
 Answer: $y = (x - 5)^2 - 2$
 CodePath: CM1.EC.51
28.
 Answer: $y = -(x - 2)^2 + 3$
 CodePath: CM1.ED.9
29.
 Answer: [graph]
 CodePath: CM1.ED.106
30.
 Answer: [graph]
 CodePath: CM1.ED.108
31.
 Answer: $y = 2(x - 6)^2 - 3$; $y = -(x - 3)^2 + 1$;
 $y = 3(x - \frac{1}{2})^2 + 5$
 CodePath: CM1.FC.31
32.
 Answer: $y = 2(x - 5)^2 - 9$; $y = -(x - 7)^2 + 3$;
 $y = 3(x - \frac{1}{3})^2 + 7$
 CodePath: CM1.FC.32
33.
 Answer: $-2, -1, 3$
 CodePath: CM1.PD.83
34.
 Answer: $-1, 3, 5$
 CodePath: CM1.PD.84
35.
 Answer: $a \leq -4$ or $-3 \leq a \leq 1$
 CodePath: TRI.DH.226
36.
 Answer: $(-5, \frac{-9}{4})$ or $(\frac{9}{4}, \infty)$
 CodePath: APC.AA.7
37.
 Answer: $(-3, -8)$
 CodePath: CM1.FE.1
38.
 Answer: $(2, 9)$
 CodePath: CM1.FE.3
39.
 Answer: $9x^2 - 48x + 54$
 CodePath: TRI.HB.34
40.
 Answer: $4x^2 + 14x$
 CodePath: TRI.HB.33
41.
 Answer: $x = -3, x = 5, y = -1$
 CodePath: TRI.ID.72
42.
 Answer: $x = 3, x = -4, y = 2$
 CodePath: TRI.ID.73
43.
 Answer: x -axis, y -axis, origin
 CodePath: TRI.HD.20
44.
 Answer: origin
 CodePath: TRI.HD.45
45.
 Answer: $x^3 - 2x^2 + x - 1, R = 3$
 CodePath: TRI.GA.105
46.
 Answer: $c^3 - 4c^2 + c + 6, R = -4$
 CodePath: TRI.GA.107
47.
 Answer: $-(x^2 + 1)^{-5}$
48.
 Answer: $-2x(x + 5)(x - 5)^{-4}$
49.
 Answer: $(x - 1)^{-1/2}(2x^2 - 2x - 5)$
50.
 Answer: $2(2x - 1)^{1/2}(3x - 2)$