

1. Y varies inversely as X and if $X = 18$ then $Y = 35$. Find Y when $X = 21$.

2. If y varies directly as x and $x = 3$ when $y = 7$, find x when $y = 98$.

3. If y varies jointly as x and z , and $y = 12$ when $x = 3$ and $z = 2$, what is the value of y when $x = 5$ and $z = 6$?

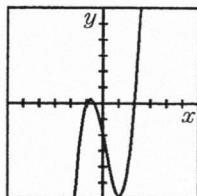
Graph.

4. $y = 2x^2 - 24x + 69$

5. $y = 3x^2 - 18x + 28$

6. $y = 4x^2 + 24x + 44$

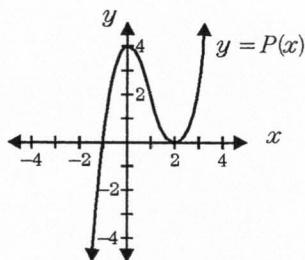
7. Find the real zeros of the function and write an equation for the graph in factored form..



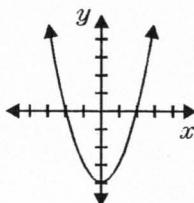
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8. Write in factored form an equation for the graph shown?



9. Write the equation for the graph.



Use long division.

10. $(p^4 + 5p^3 + p^2 + 20p - 12) \div (p^2 + 4)$

11. $(x^4 + x^3 + 6x^2 - 2x - 16) \div (x^2 - 2)$

12. $(3k^4 + 2k^3 + 4k^2 + 6k - 15) \div (k^2 + 3)$

13. Factor the polynomial $P(x) = x^3 + 2x^2 - 11x - 12$ completely.

14. Given $x = 2$ is a root of $6x^3 - 13x^2 + 4 = 0$, factor the polynomial $P(x) = 6x^3 - 13x^2 + 4$.

15. One factor of $x^3 + 3x^2 - 16x - 48$ is $x + 4$. What are the remaining two factors?

Find all real solutions.

16. $x^3 - 2x^2 - 3x + 6 = 0$

17. $x^3 + 3x^2 - 5x - 15 = 0$

18. $x^3 + x^2 - 2x - 2 = 0$

19. $x^4 + x^3 - 26x^2 + 24x = 0$

20. $x^4 - 6x^3 - x^2 + 30x = 0$

21. $x^4 - 3x^3 - 25x^2 - 21x = 0$

State all horizontal and vertical asymptotes of the function.

22. $f(x) = \frac{x^2 - 4}{x^2 - x - 6}$

23. $q(x) = \frac{x - 3}{x^2 - x - 20}$

24. $f(x) = \frac{x - 4}{x^2 - x - 6}$

25. Evaluate: $\log_9 \frac{1}{\sqrt[3]{27}}$

26. Evaluate: $\log_3 27\sqrt{3}$

27. Evaluate: $\log_3 \sqrt[3]{9}$

Write as the sum or difference of logarithms with no exponents.

$$28. \log \frac{\sqrt{ab}}{c}$$

$$29. \log_c \sqrt[3]{\frac{x^4}{y^3 z^2}}$$

$$30. \log_a \sqrt{\frac{x^6}{y^5 z^8}}$$

Solve.

$$31. 8^x = 16^{4x-1}$$

$$32. 6^{3x} = 36^{x+1}$$

$$33. 25^{-2x} = 5^{6x-3}$$

$$34. \log_2(x+1) + \log_2(x-1) = 3$$

$$35. 2 = \log_4(2x) + \log_4(x-2)$$

$$36. \log_4(x+3) - \log_4(x-5) = 2$$

$$37. \log(2y-1) = \log(5y+4)$$

$$38. \log(d) + \log(2d+1) = \log(7d)$$

$$39. \text{Solve for } x: \log 81 = 4 \log x$$

Answer List

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|--|--|---|
| 1. $Y = 30$ | 2. 42 | 3. 60 |
| 4. $(6, -3), (6, -2\frac{7}{8}), y = -3\frac{1}{8}$ | 5. $(3, 1), (3, 1\frac{1}{12}), y = \frac{11}{12}$ | 6. $(-3, 8), (-3, 8\frac{1}{16}), y = 7\frac{15}{16}$ |
| 7. $y = (x + 1)(x + \frac{1}{2})(x - 2)$ | 8. $y = (x - 2)^2(x + 1)$ | 9. $y = x^2 - 4$ |
| 10. $p^2 + 5p - 3$ | 11. $x^2 + x + 8$ | 12. $3k^2 + 2k - 5$ |
| 13. $(x - 3)(x + 1)(x + 4)$ | 14. $(x - 2)(3x - 2)(2x + 1)$ | 15. $(x + 3)$ and $(x - 4)$ |
| 16. $2, \pm\sqrt{3}$ | 17. $-3, \pm\sqrt{5}$ | 18. $-1, \pm\sqrt{2}$ |
| 19. $0, 1, 4, -6$ | 20. $0, 3, -2, 5$ | 21. $0, -1, 7, -3$ |
| 22. $x = 3, y = 1$ | 23. $x = -4, x = 5, y = 0$ | 24. $x = -2, x = 3, y = 0$ |
| 25. $-\frac{3}{4}$ | 26. $\frac{7}{2}$ | 27. $\frac{2}{3}$ |
| 28. $\frac{1}{2} \log a + \frac{1}{2} \log b - \log c$ | 29. $\frac{4}{3} \log_c x - \log_c y - \frac{2}{3} \log_c z$ | 30. $3 \log_a x - \frac{5}{2} \log_a y - 4 \log_a z$ |
| 31. $x = \frac{4}{13}$ | 32. $x = 2$ | 33. $x = \frac{3}{10}$ |
| 34. $x = 3$ | 35. $x = 4$ | 36. $x = \frac{83}{15}$ |
| 37. $y = -\frac{5}{3}$ | 38. $d = 3$ | 39. 3 |

Catalog List

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|----------------|----------------|----------------|
| 1. CM1 FA 24 | 2. CM1 FA 22 | 3. CM1 FA 35 |
| 4. TRI JA 41 | 5. TRI JA 42 | 6. TRI JA 44 |
| 7. | 8. | 9. |
| 10. ALG EI 45 | 11. ALG EI 46 | 12. ALG EI 47 |
| 13. CM1 PC 5 | 14. CM1 PC 7 | 15. CM1 PC 9 |
| 16. TRI GH 28 | 17. TRI GH 27 | 18. TRI GH 26 |
| 19. TRI GH 81 | 20. TRI GH 82 | 21. TRI GH 83 |
| 22. TRI ID 57 | 23. TRI ID 30 | 24. TRI ID 31 |
| 25. CM1 OA 59 | 26. CM1 OA 57 | 27. CM1 OA 62 |
| 28. TRI KC 82 | 29. TRI KC 85 | 30. TRI KC 86 |
| 31. TRI KF 14 | 32. TRI KF 13 | 33. TRI KF 15 |
| 34. TRI KF 147 | 35. TRI KF 138 | 36. TRI KF 148 |
| 37. TRI KF 152 | 38. TRI KF 159 | 39. CM1 OD 20 |