

Long Division

Introduction to Algebra

Divide:

- $x^2 + 8x - 105$ by $x + 15$.
- $x^2 + 8x - 33$ by $x + 11$.
- $x^4 + x^2 - 20$ by $x^2 - 4$.
- $y^4 - y^2 - 30$ by $y^2 + 5$.
- $x^4 - 31x^2 + 9$ by $x^2 + 5x - 3$.
- $a^4 - 12a^2 + 16$ by $a^2 - 2a - 4$.
- $x^3 - y^3$ by $x - y$.
- $a^3 + b^3$ by $a + b$.
- $16a^4 - 81b^4$ by $2a - 3b$.
- $81x^8 - y^4$ by $3x^2 - y$.
- $x^5 - x^4y - 2x^3y^2 - 5x^2y^3 - 17xy^4 - 12y^5$ by $x^2 - 2xy - 3y^2$.
- $a^5 + a^4b - 14a^3b^2 + 15a^2b^3 - 4b^3$ by $a^2 - 3ab + 2b^2$.
- $x^6 - 5x^3 + 3 + 5x^4 - 10x - x^5 + 10x^2$ by $x^2 + 3 - x$.
- $x^6 - 2x^3 - 2 + x - 3x^5 + 2x^4 - 5x^2$ by $x^3 + 2 + x$.
- $a^5 - a - 2a^2 - a^3$ by $a + a^3 + a^2$.
- $x^6 - 2x^3 - x^2 - x^4$ by $1 + xx^2 + x$.
- $a^{11} - a^2$ by $a^3 - 1$.
- $a^{12} - a^4$ by $a^2 + 1$.
- $x^4 + 4y^4$ by $x^2 - 2xy + y^2$.
- $4a^4 + 81b^4$ by $2a^2 + 6ab + 9b^2$.
- If a boy can do a piece of work in x minutes, how many hours would it take him to perform 12 times as much work?
- A man has x dollars, y acres of land worth m dollars an acre, and c houses each worth b dollars. What is my share if I am one of n heirs?
- A storekeeper mixed m pounds of coffee worth a cents a pound with p pounds worth b cents a pound. How much is the mixture worth per pound?
- If John is y years old, how old was he 11 years ago?
- $\frac{1}{2}x^4 + \frac{3}{4}x^3y - \frac{1}{3}x^2y^2 + \frac{7}{6}xy^3 - \frac{1}{3}y^4$ by $x^2 - \frac{1}{2}xy + y^2$.
- $\frac{2}{9}y^3 - \frac{5}{36}x^2y + \frac{1}{6}xy^2 + \frac{1}{6}x^3$ by $\frac{1}{2}x + \frac{1}{3}y$.
- $\frac{1}{4}(x - y)^5 - (x - y)^3 - \frac{1}{2}(x - y)^2 - \frac{1}{16}(x - y)$ by $\frac{1}{2}(x - y)^2 + (x - y) + \frac{1}{4}$.
- $16x^8 - 81y^4$ by $27y^3 + 18x^2y^2 + 8x^6 + 12x^4y$.
- $4x^4 - 10x^2 + 6$ by $x + 1$.
- $4a^4 - 5a^2b^2 + b^4$ by $2a - b$.
- $a^6 - b^6 + a^4 + b^4 + a^2b^2$ by $a^2 - b^2 + 1$.
- $x^6 - y^6 - x^4 - y^4 - x^2y^2$ by $x^2 - y^2 - 1$.
- $81a^{12} - 16b^8$ by $12a^3b^4 - 8b^6 - 18a^6b^2 + 27a^9$.
- $1 + 3x$ by $1 + x$ to four terms of quotient.
- $1 - 2a$ by $1 - a$ to four terms of quotient.
- $4 + a$ by $2 - a$ to four terms.
- $9 - x$ by $3 + x$ to four terms.

Long Division solutions

- $x - 7$.
- $x - 3$.
- $x^2 + 5$.
- $y^2 - 6$.
- $x^2 - 5x - 3$.
- $a^2 + 2a - 4$.
- $x^2 + xy + y^2$.
- $a^2 - ab + b^2$.
- $8a^3 + 12a^2b + 18ab^2 + 27b^3$.
- $27x^5 + 9x^4y + 3x^2y^2 + y^3$.
- $x^3 + x^2y + 3xy^2 + 4y^3$.
- $a^3 + 4a^2b - 3ab^2 - 2b^3$.
- $x^4 + 2x^2 - 3x + 1$.
- $x^3 - 3x^2 + x - 1$.
- $a^2 - a - 1$.
- $x^4 - x^3 - x^2$.
- $a^8 + a^5 + a^2$.
- $a^{10} - a^8 + a^6 - a^4$.
- $x^2 + 2xy + 2y^2$.
- $2a^2 - 6ab + 9b^2$.
- $\frac{1}{2}x^2 + xy - \frac{1}{3}y^2$.
- $\frac{1}{3}x^2 - \frac{1}{2}xy + \frac{2}{3}y^2$.
- $\frac{1}{2}(x - y)^3 - (x - y)^2 - \frac{1}{4}(x - y)$.
- $2x^2 - 3y$.
- $4x^3 - 4x^2 - 6x + 6$.
- $2a^3 + a^2b - 2ab^2 - b^3$.
- $a^4 + a^2b^2 + b^4$.
- $x^4 + x^2y^2 + y^4$.
- $3a^3 + 2b^2$.
- $1 + 2x - 2x^2 + 2x^3 - \text{etc.}$
- $1 - a - a^2 - a^3 - \text{etc.}$
- $2 + \frac{3}{2}a + \frac{3}{4}a^2 + \frac{3}{8}a^3 + \text{etc.}$
- $3 - \frac{4}{3}x + \frac{4}{9}x^2 - \frac{4}{27}x^3 + \text{etc.}$
- $\frac{x}{5}$ hrs.
- $\frac{x + my + bc}{n}$ dols.
- $\frac{am + bp}{m + p}$ cts.
- $y - 11$ yrs.

Problems from the book:
A First Book in Algebra
Wallace C. Boyd, A.M.
1895

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