

הוצאת גורם משותף

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|-----|-------------------------|-----|--------------------------------|
| 1. | $5x^2 + 15x =$ | 11. | $36y^3x - 42x^3y =$ |
| 2. | $2xy - 4x^2 =$ | 12. | $24xy^4 + 12x^3y^2 =$ |
| 3. | $12xy + 27xy^2 =$ | 13. | $8tz - 48t^2z + 16 =$ |
| 4. | $-6t^3 + t^2z =$ | 14. | $t^4z + t^3x - t^2p =$ |
| 5. | $10a + 30ab + 45 =$ | 15. | $2x - yx + yx^2 =$ |
| 6. | $2 + 14ab - 8b + 10a =$ | 16. | $9z + 2z^2 + z^3 + 5z^4 =$ |
| 7. | $18 - 39a + 45t + 3a =$ | 17. | $-16x^2 + 5z^2 - 3 =$ |
| 8. | $28kn + 49k + 63 =$ | 18. | $a^3b^4 - a^4b^3 =$ |
| 9. | $t^3 - t^4 =$ | 19. | $10x^2z - 6z + 14xz^2 - 3 =$ |
| 10. | $y^{10} + y^8 =$ | 20. | $169a^4b^3 + 26a^2b - 39a^3 =$ |

הוצאת גורם משותף - תשובות

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| 1. | $5x^2 + 15x = 5x(x + 3)$ | 11. | $36y^3x - 42x^3y = 6xy(6y^2 - 7x^2)$ |
| 2. | $2xy - 4x^2 = 2x(y - 2x)$ | 12. | $24xy^4 + 12x^3y^2 = 12xy(2y^3 + x^2y)$ |
| 3. | $12xy + 27xy^2 = 3xy(4 + 9y)$ | 13. | $8tz - 48t^2z + 16 = 8(tz - 6t^2z + 2) / 8tz(1 - 6t) + 16$ |
| 4. | $-6t^3 + t^2z = t^2(-6t + z)$ | 14. | $t^4z + t^3x - t^2p = t^2(t^2z + tx - p)$ |
| 5. | $10a + 30ab + 45 = 5(2a + 6ab + 9)$ | 15. | $2x - yx + yx^2 = x(2 - y + yx) / 2x - xy(1 - x)$ |
| 6. | $2 + 14ab - 8b + 10a = 2(1 + 7ab - 4b + 5a)$ | 16. | $9z + 2z^2 + z^3 + 5z^4 = z(9 + 2z + z^2 + 5z^3)$ |
| 7. | $18 - 39a + 45t + 3a = 18 - 36a + 45t = 3(6 - 12a + 15t)$ | 17. | $-16x^2 + 5z^2 - 3 = -16x^2 + 5z^2 - 3$ |
| 8. | $28kn + 49k + 63 = 7k(4n + 7) + 63 / 7(4kn + 7k + 9)$ | 18. | $a^3b^4 - a^4b^3 = a^3b^3(b - a)$ |
| 9. | $t^3 - t^4 = t^3(1 - t)$ | 19. | $10x^2z - 6z + 14xz^2 - 3 = 2xz(5x + 7z) - 3(1 + 2z) / 2z(5x^2 - 3 + 7xz) - 3$ |
| 10. | $y^{10} + y^8 = y^8(y^2 + 1)$ | 20. | $169a^4b^3 + 26a^2b - 39a^3 = 13a^2(13a^2b^3 + 2b - 3a)$ |

שברים אלגבריים – פישוט וצמצום (בהנחה שהנעלמים לא שווים ל-0)

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| 1. | $\frac{4x+24}{4} =$ | 16. | $\frac{42a^3+7a^2}{18a^2+3a} =$ |
| 2. | $\frac{5x-25}{5} =$ | 17. | $\frac{t-1}{t^2-1} =$ |
| 3. | $\frac{12+4x}{8} =$ | 18. | $\frac{x^2-4}{x+2} =$ |
| 4. | $\frac{3x+9}{3} =$ | 19. | $\frac{y+3}{y^2+9} =$ |
| 5. | $\frac{21x-35}{28} =$ | 20. | $\frac{144-x^2}{x+12} =$ |
| 6. | $\frac{10a+a^2}{10a} =$ | 21. | $\frac{3y+15}{y^2-25} =$ |
| 7. | $\frac{12y^2+4y}{16y} =$ | 22. | $\frac{a^2-100}{9a+90} =$ |
| 8. | $\frac{5x^2+15x}{5x} =$ | 23. | $\frac{16-36x^2}{32-48x} =$ |
| 9. | $\frac{x}{2x^2-7x} =$ | 24. | $\frac{121-169x^2}{22+26x} =$ |
| 10. | $\frac{11x}{22x^2+11x} =$ | 25. | $\frac{9x-x^3}{x+3} =$ |
| 11. | $\frac{9y^2+9y}{4y+4} =$ | 26. | $\frac{98a^3-8a}{7a-2} =$ |
| 12. | $\frac{12a^2+7a}{7a^2-9a} =$ | 27. | $\frac{-48k+75k^3}{45k^2-36k} =$ |
| 13. | $\frac{10x^2+20x}{30x-40x^2} =$ | 28. | $\frac{x^2+4x+4}{x+2} =$ |
| 14. | $\frac{14x^2+8x}{28x+16} =$ | 29. | $\frac{-24x+16+9x^2}{3x-4} =$ |
| 15. | $\frac{8y^2-20y}{10y-25} =$ | 30. | $\frac{(2x+2)^2}{x+1} =$ |

שברים אלגבריים – פישוט וצמצום- תשובות

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| 1. | $\frac{4x+24}{4} = \frac{4x}{4} + \frac{24}{4} = x+6$ |
| 2. | $\frac{5x-25}{5} = \frac{5x}{5} - \frac{25}{5} = x-5$ |
| 3. | $\frac{12+4x}{8} = \frac{4(3+x)}{8} = \frac{3+x}{2}$ |
| 4. | $\frac{3x+9}{3} = \frac{3x}{3} + \frac{9}{3} = x+3$ |
| 5. | $\frac{21x-35}{28} = \frac{7(3x-5)}{28} = \frac{3x-5}{4}$ |
| 6. | $\frac{10a+a^2}{10a} = \frac{10a}{10a} + \frac{a^2}{10a} = 1 + \frac{a}{10}$ |
| 7. | $\frac{12y^2+4y}{16y} = \frac{4y(3y+1)}{16y} = \frac{3y+1}{4}$ |
| 8. | $\frac{5x^2+15x}{5x} = \frac{5x^2}{5x} + \frac{15x}{5x} = x+3$ |
| 9. | $\frac{x}{2x^2-7x} = \frac{x}{x(2x-7)} = \frac{1}{2x-7}$ |
| 10. | $\frac{11x}{22x^2+11x} = \frac{11x}{11x(2x+1)} = \frac{1}{2x+1}$ |
| 11. | $\frac{9y^2+9y}{4y+4} = \frac{9y(y+1)}{4(y+1)} = \frac{9y}{4} = 2\frac{1}{4}y$ |
| 12. | $\frac{12a^2+7a}{7a^2-9a} = \frac{a(12a+7)}{a(7a-9)} = \frac{12a+7}{7a-9}$ |
| 13. | $\frac{10x^2+20x}{30x-40x^2} = \frac{10x(x+2)}{10x(3-4x)} = \frac{x+2}{3-4x}$ |
| 14. | $\frac{14x^2+8x}{28x+16} = \frac{2x(7x+4)}{4(7x+4)} = \frac{x}{2}$ |
| 15. | $\frac{8y^2-20y}{10y-25} = \frac{4y(2y-5)}{5(2y-5)} = \frac{4y}{5}$ |

שברים אלגבריים – פישוט וצמצום- תשובות (המשך)

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| 16. | $\frac{42a^3 + 7a^2}{18a^2 + 3a} = \frac{7a^2(6a+1)}{3a(6a+1)} = \frac{7a}{3} = 2\frac{1}{3}a$ |
| 17. | $\frac{t-1}{t^2-1} = \frac{t-1}{(t-1)(t+1)} = \frac{1}{t+1}$ |
| 18. | $\frac{x^2-4}{x+2} = \frac{(x+2)(x-2)}{x+2} = x-2$ |
| 19. | $\frac{y+3}{y^2+9} = \frac{y+3}{y^2+9}$ |
| 20. | $\frac{144-x^2}{x+12} = \frac{(12-x)(12+x)}{x+12} = 12-x$ |
| 21. | $\frac{3y+15}{y^2-25} = \frac{3(y+5)}{(y+5)(y-5)} = \frac{3}{y-5}$ |
| 22. | $\frac{a^2-100}{9a+90} = \frac{(a+10)(a-10)}{9(a+10)} = \frac{a-10}{9}$ |
| 23. | $\frac{16-36x^2}{32-48x} = \frac{4(4-9x^2)}{8(4-6x)} = \frac{4-9x^2}{2(4-6x)} = \frac{(2-3x)(2+3x)}{8-12x} = \frac{(2-3x)(2+3x)}{4(2-3x)} = \frac{2+3x}{4}$ |
| 24. | $\frac{121-169x^2}{22+26x} = \frac{(11-13x)(11+13x)}{2(11+13x)} = \frac{11-13x}{2}$ |
| 25. | $\frac{9x-x^3}{x+3} = \frac{x(9-x^2)}{x+3} = \frac{x(3-x)(3+x)}{x+3} = x(3-x)$ |
| 26. | $\frac{98a^3-8a}{7a-2} = \frac{2a(49a^2-4)}{7a-2} = \frac{2a(7a-2)(7a+2)}{7a-2} = 2a(7a+2) = 14a^2+4a$ |
| 27. | $\frac{-48k+75k^3}{45k^2-36k} = \frac{3k(-16+25k^2)}{9k(5k-4)} = \frac{3k(5k-4)(5k+4)}{9k(5k-4)} = \frac{3k(5k+4)}{9k} = \frac{5k+4}{3}$ |
| 28. | $\frac{x^2+4x+4}{x+2} = \frac{(x+2)^2}{x+2} = x+2$ |
| 29. | $\frac{-24x+16+9x^2}{3x-4} = \frac{(3x-4)^2}{3x-4} = 3x-4$ |
| 30. | $\frac{(2x+2)^2}{x+1} = \frac{4x^2+8x+4}{x+1} = \frac{4(x^2+2x+1)}{x+1} = \frac{4(x+1)^2}{x+1} = 4x+4$ |

כינוס האיברים הדומים

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|-----|------------------------------|-----|---|
| 1. | $21+7x-3+2x=$ | 11. | $(5x+2)(x-3)=$ |
| 2. | $11a-11-a+1=$ | 12. | $(10a-10)(b+4)(a-5)=$ |
| 3. | $5x+10y-6x-6y=$ | 13. | $-5p(-4p+k)-(kp+p^2)=$ |
| 4. | $8a+b+a-9b=$ | 14. | $-2(5y+7)(y+7)-10y^2=$ |
| 5. | $3x^2+y+7x^2-5y=$ | 15. | $(t-1)(x+6)(t+2)=$ |
| 6. | $5z+7-x+z-7x=$ | 16. | $p+\frac{p}{2}+4+\frac{p}{p}=$ |
| 7. | $9x^2+10x^4y^4+x^4y^4+2x^2=$ | 17. | $\left(1\frac{1}{2}a-a\right)-\frac{1}{2}+a-9=$ |
| 8. | $-xy+x^2y-7xy+xy^2=$ | 18. | $\frac{b}{4}+\frac{3a}{4}+\frac{2b}{4}=$ |
| 9. | $10p+5pz-3p+12pz=$ | 19. | $\frac{(5+y)}{5}+\frac{-(1+3y)}{5}=$ |
| 10. | $(-2+y)(y+5)-3y=$ | 20. | $\frac{-(2x+y+4)}{y}-\frac{(3-x)}{y}=$ |

כינוס איברים דומים - תשובות

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|-----|--|-----|--|
| 1. | $21+7x-3+2x=18+9x$ | 11. | $(5x+2)(x-3)=5x^2-15x+2x-6=5x^2-13x-6$ |
| 2. | $11a-11-a+1=10a-10$ | 12. | $(10a-10)(b+4)(a-5)=$ $(10ab+40a-10b-40)(a-5)=$ $10a^2b+40a^2-10ab-40a-50ab-200a+50b+200=$ $10a^2b+40a^2-60ab-240a+50b+200$ |
| 3. | $5x+10y-6x-6y=4y-x$ | 13. | $-5p(-4p+k)-(kp+p^2)=20p^2-5kp-kp-p^2=$ $19p^2-6kp$ |
| 4. | $8a+b+a-9b=9a-8b$ | 14. | $-2(5y+7)(y+7)-10y^2=-2(5y^2+35y+7y+49)-10y^2=$ $-20y^2-84y-98$ |
| 5. | $3x^2+y+7x^2-5y=10x^2-4y$ | 15. | $(t-1)(x+6)(t+2)=(tx+6t-x-6)(t+2)=$ $t^2x+6t^2-xt-6t+2xt+12t-2x-12=$ $t^2x+6t^2+xt+6t-2x-12$ |
| 6. | $5z+7-x+z-7x=6z+7-8x$ | 16. | $p+\frac{p}{2}+4+\frac{p}{p}=\frac{3p}{2}+5$ |
| 7. | $9x^2+10x^4y^4+x^4y^4+2x^2=11x^2+11x^4y^4$ | 17. | $\left(1\frac{1}{2}a-a\right)-\frac{1}{2}+a-9=\frac{a}{2}-\frac{1}{2}+a-9=$ $\frac{3a}{2}-9\frac{1}{2}$ |
| 8. | $-xy+x^2y-7xy+xy^2=x^2y+xy^2-8xy$ | 18. | $\frac{b}{4}+\frac{3a}{4}+\frac{2b}{4}=\frac{3b+3a}{4}$ |
| 9. | $10p+5pz-3p+12pz=7p+17pz$ | 19. | $\frac{(5+y)}{5}+\frac{-(1+3y)}{5}=\frac{4-2y}{5}$ |
| 10. | $(-2+y)(y+5)-3y=$ $-2y-10+y^2+5y-3y=y^2-10$ | 20. | $\frac{-(2x+y+4)}{y}-\frac{(3-x)}{y}=\frac{-x-y-7}{y}$ |

חיבור וחסור של אברים אלגבריים

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|-----|-------------------------------------|-----|--|
| 1. | $\frac{x}{2} + \frac{x}{7} =$ | 11. | $\frac{y-8}{2y} - \frac{y+4}{7y} =$ |
| 2. | $\frac{y}{6} + \frac{y}{18} =$ | 12. | $\frac{10}{x^2} - \frac{1}{2x} =$ |
| 3. | $\frac{3x}{5} + \frac{2x}{6} =$ | 13. | $3 - \frac{6}{4x^2} =$ |
| 4. | $\frac{5y}{3} - \frac{5y}{8} =$ | 14. | $\frac{1}{x} + \frac{2}{x+2} =$ |
| 5. | $\frac{4x}{5} + x =$ | 15. | $\frac{y+2}{1+y} - \frac{1-y}{y-1} =$ |
| 6. | $10 - \frac{3x}{6} =$ | 16. | $\frac{1+k}{-8+7k} - \frac{-3k+1}{8-7k} =$ |
| 7. | $\frac{x+2}{2} + \frac{x}{5} =$ | 17. | $\frac{-2x+10}{2x+8} + \frac{9x+9}{3x+12} =$ |
| 8. | $\frac{4x-5}{6} - \frac{x+1}{2} =$ | 18. | $\frac{4x+8}{10x-5} - \frac{2x+5}{6x-3} =$ |
| 9. | $\frac{2x+y}{4} - \frac{2y-x}{2} =$ | 19. | $\frac{6}{x^2-1} + \frac{3}{x+1} =$ |
| 10. | $\frac{a+1}{3a} + \frac{a+4}{2a} =$ | 20. | $\frac{a^2+4}{a^2-4} - \frac{a}{a-2} =$ |

חיבור וחסור של אברים אלגבריים - תשובות

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|-----|--|
| 1. | $\frac{x}{2} + \frac{x}{7} = \frac{7x}{14} + \frac{2x}{14} = \frac{9x}{14}$ |
| 2. | $\frac{y}{6} + \frac{y}{18} = \frac{3y}{18} + \frac{y}{18} = \frac{4y}{18} = \frac{2y}{9}$ |
| 3. | $\frac{3x}{5} + \frac{2x}{6} = \frac{18x}{30} + \frac{10x}{30} = \frac{28x}{30} = \frac{14x}{15}$ |
| 4. | $\frac{5y}{3} - \frac{5y}{8} = \frac{40y}{24} - \frac{15y}{24} = \frac{25y}{24} = 1\frac{1}{24}y$ |
| 5. | $\frac{4x}{5} + x = \frac{4x}{5} + \frac{5x}{5} = \frac{9x}{5} = 1\frac{4}{5}x$ |
| 6. | $10 - \frac{3x}{6} = 10 - \frac{x}{2} = \frac{20-x}{2}$ |
| 7. | $\frac{x+2}{2} + \frac{x}{5} = \frac{5(x+2)}{10} + \frac{2x}{10} = \frac{5x+10+2x}{10} = \frac{7x+10}{10} = \frac{7x}{10} + \frac{10}{10} = \frac{7x}{10} + 1$ |
| 8. | $\frac{4x-5}{6} - \frac{x+1}{2} = \frac{4x-5}{6} - \frac{3(x+1)}{6} = \frac{4x-5}{6} - \frac{3x+3}{6} = \frac{4x-5-(3x+3)}{6} = \frac{4x-5-3x-3}{6} = \frac{x-8}{6}$ |
| 9. | $\frac{2x+y}{4} - \frac{2y-x}{2} = \frac{2x+y}{4} - \frac{2(2y-x)}{4} = \frac{2x+y-(4y-2x)}{4} = \frac{2x+y-4y+2x}{4} = \frac{4x-3y}{4} =$ $\frac{4x}{4} - \frac{3y}{4} = x - \frac{3y}{4}$ |
| 10. | $\frac{a+1}{3a} + \frac{a+4}{2a} = \frac{2(a+1)}{6a} + \frac{3(a+4)}{6a} = \frac{2a+2+3a+12}{6a} = \frac{5a+14}{6a} = \frac{5a}{6a} + \frac{14}{6a} = \frac{5}{6} + 2\frac{1}{3}a$ |

חיבור וחסור של אברים אלגבריים – תשובות (המשך)

| | |
|-----|---|
| 11. | $\frac{y-8}{2y} - \frac{y+4}{7y} = \frac{7(y-8)}{14y} - \frac{2(y+4)}{14y} = \frac{7y-56-(2y+8)}{14y} = \frac{7y-56-2y-8}{14y} = \frac{5y-64}{14y}$ |
| 12. | $\frac{10}{x^2} - \frac{1}{2x} = \frac{20-x}{2x^2}$ |
| 13. | $3 - \frac{6}{4x^2} = 3 - \frac{3}{2x^2} = \frac{6x^2-3}{2x^2}$ |
| 14. | $\frac{1}{x} + \frac{2}{x+2} = \frac{x+2+2x}{x(x+2)} = \frac{2+3x}{x^2+2x}$ |
| 15. | $\frac{y+2}{1+y} - \frac{1-y}{y-1} = \frac{(y+2)(y-1)-(1-y)(1+y)}{y^2-1} = \frac{(y+2)(y-1)-(1-y^2)}{y^2-1} = \frac{(y+2)(y-1)}{(y+1)(y-1)} + \frac{-1+y^2}{y^2-1} = \frac{(y+2)}{(y+1)} + 1$ |
| 16. | $\frac{1+k}{-8+7k} - \frac{-3k+1}{8-7k} = -\frac{1+k}{8-7k} - \frac{-3k+1}{8-7k} = \frac{-(1+k)-(-3k+1)}{8-7k} = \frac{-1-k+3k-1}{8-7k} = \frac{-2+2k}{8-7k}$ |
| 17. | $\frac{-2x+10}{2x+8} + \frac{9x+9}{3x+12} = \frac{2(-x+5)}{2(x+4)} + \frac{9(x+1)}{3(x+4)} = \frac{-x+5}{x+4} + \frac{3(x+1)}{x+4} = \frac{-x+5+3x+3}{x+4} = \frac{2x+8}{x+4} = \frac{2(x+4)}{x+4} = 2$ |
| 18. | $\frac{4x+8}{10x-5} - \frac{2x+5}{6x-3} = \frac{4(x+2)}{5(2x-1)} - \frac{2x+5}{3(2x-1)} = \frac{12(x+2)-5(2x+5)}{15(2x-1)} = \frac{12x+24-10x-25}{15(2x-1)} = \frac{2x-1}{15(2x-1)} = \frac{1}{15}$ |
| 19. | $\frac{6}{x^2-1} + \frac{3}{x+1} = \frac{6}{(x+1)(x-1)} + \frac{3(x-1)}{(x+1)(x-1)} = \frac{6+3x-3}{(x+1)(x-1)} = \frac{3+3x}{(x+1)(x-1)} = \frac{3(x+1)}{(x+1)(x-1)} = \frac{3}{x-1}$ |
| 20. | $\frac{a^2+4}{a^2-4} - \frac{a}{a-2} = \frac{a^2+4}{(a+2)(a-2)} - \frac{a(a+2)}{(a+2)(a-2)} = \frac{a^2+4-a^2-2a}{(a+2)(a-2)} = \frac{-2(a-2)}{(a+2)(a-2)} = -\frac{2}{a+2}$ |