

# Funktionen in 'R<sup>2</sup>

## 9. Schulstufe

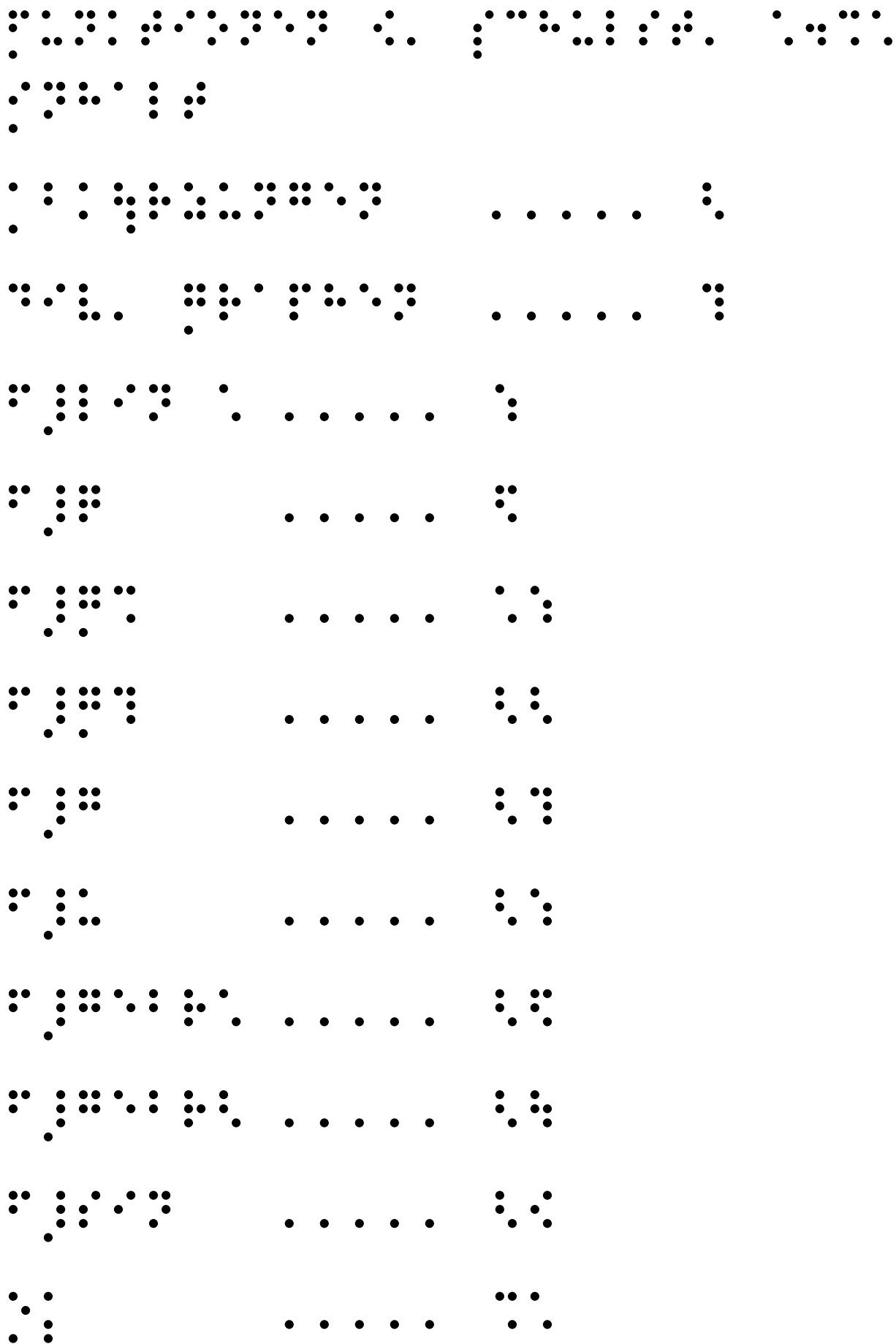
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Schwelldruckkopiervorlagen mit  
Braillebeschriftung

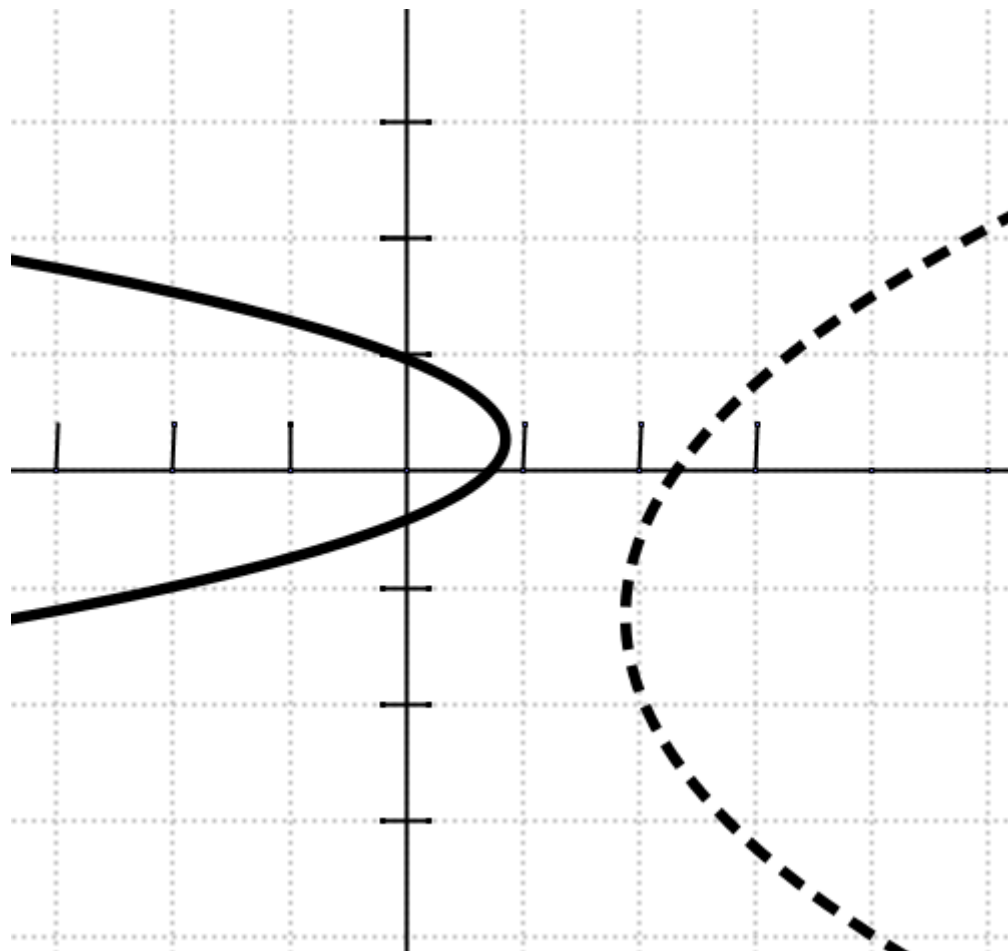
**Stanetty Elisabeth**

**25.01.2019**

Inhalt: Grafiken zu den Themen: einem x-Wert werden mehr als ein y-Wert zugeordnet, lineare Funktion, quadratische Funktion, Polynomfunktion 3. Grades, Polynomfunktion 4. Grades, gerade Funktion, ungerade Funktion, gebrochen rationale Funktion mit x im Nenner, gebrochen rationale Funktion mit  $x^2$  im Nenner, Sinusfunktion und Einheitskreis







$\frac{1}{2} \cdot \frac{3}{4} = \frac{1 \cdot 3}{2 \cdot 4} = \frac{3}{8}$

$\frac{2}{3} \cdot \frac{4}{5} = \frac{2 \cdot 4}{3 \cdot 5} = \frac{8}{15}$

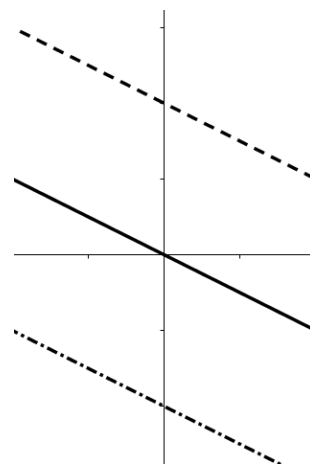
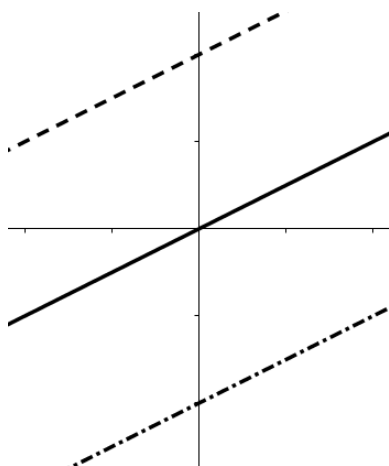
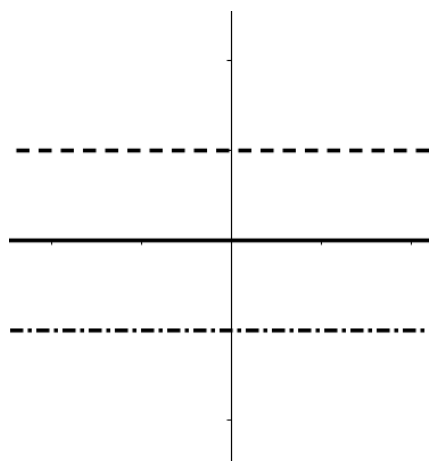
$\frac{5}{6} \cdot \frac{7}{8} = \frac{5 \cdot 7}{6 \cdot 8} = \frac{35}{48}$

$\frac{1}{2} \cdot \frac{3}{4} = \frac{1 \cdot 3}{2 \cdot 4} = \frac{3}{8}$

$\frac{2}{3} \cdot \frac{4}{5} = \frac{2 \cdot 4}{3 \cdot 5} = \frac{8}{15}$

$\frac{5}{6} \cdot \frac{7}{8} = \frac{5 \cdot 7}{6 \cdot 8} = \frac{35}{48}$

$\frac{1}{2} \cdot \frac{3}{4} = \frac{1 \cdot 3}{2 \cdot 4} = \frac{3}{8}$











$\frac{1}{2}x^2 + 3x + \frac{1}{2}$

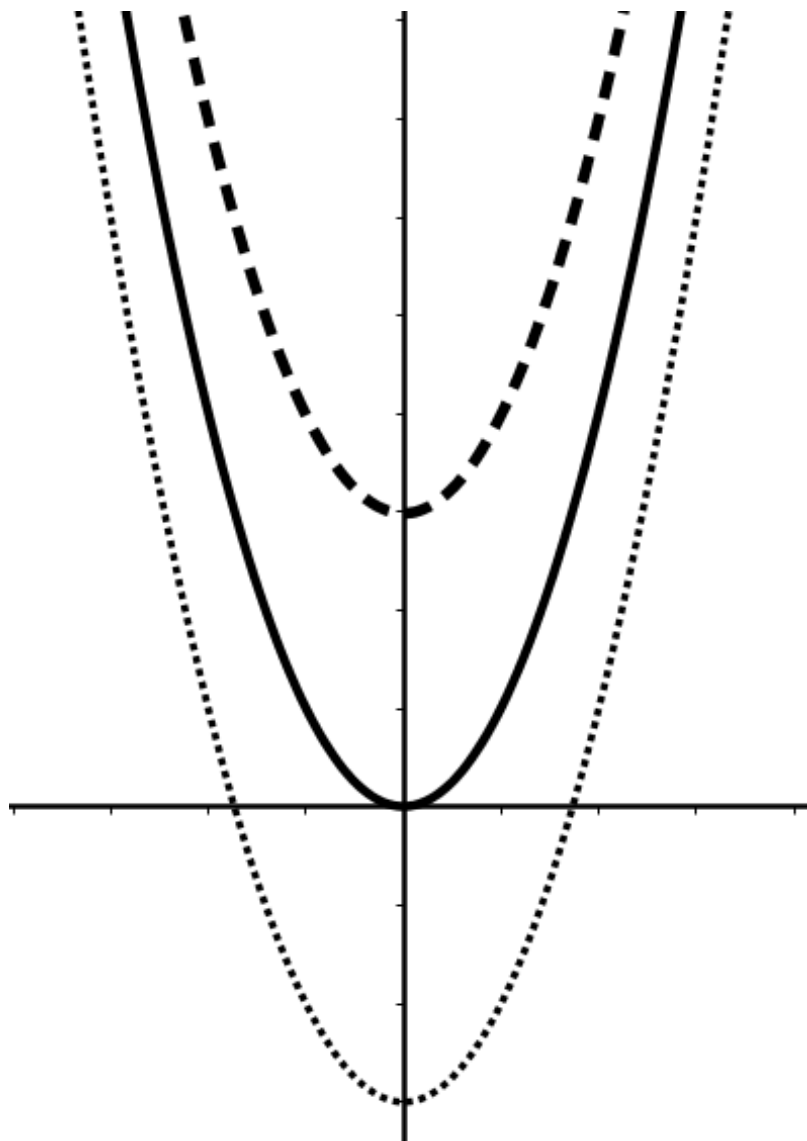
$\frac{1}{2}x^2 + 3x + \frac{1}{2}$

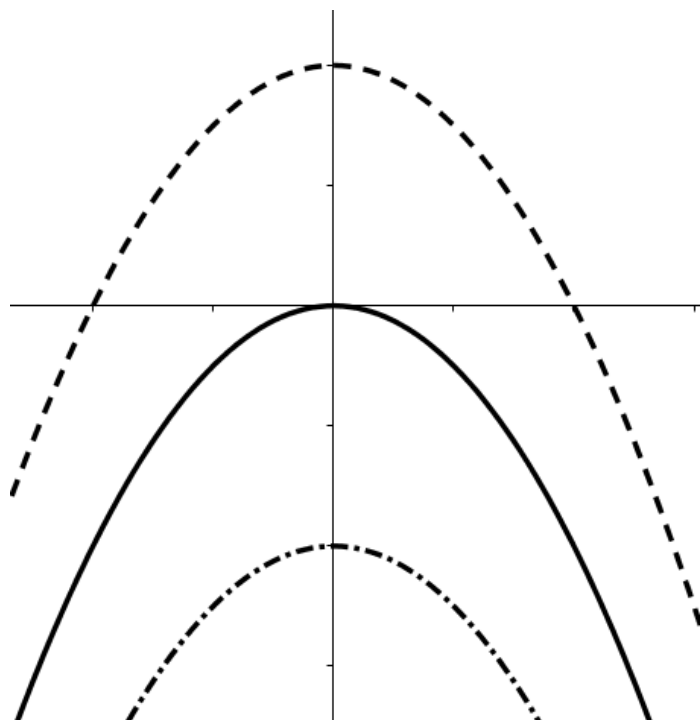
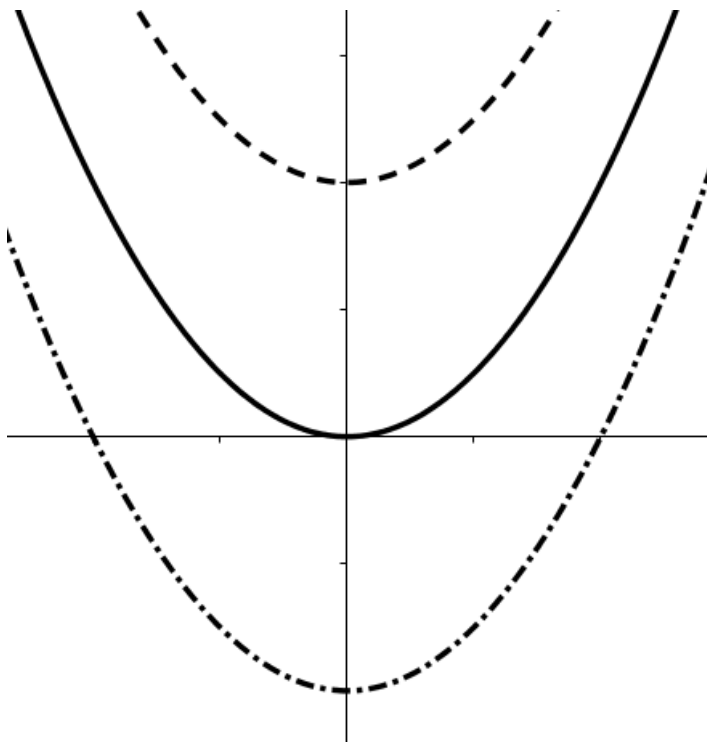
$\frac{1}{2}x^2 + 3x + \frac{1}{2}$

$\frac{1}{2}x^2 + 3x + \frac{1}{2}$

$\frac{1}{2}x^2 + 3x + \frac{1}{2}$

$\frac{1}{2}x^2 + 3x + \frac{1}{2}$





$\frac{1}{2} \frac{d}{dt} \left( \frac{1}{2} m v^2 \right) = \frac{1}{2} m v \frac{dv}{dt} = \frac{1}{2} m v a$

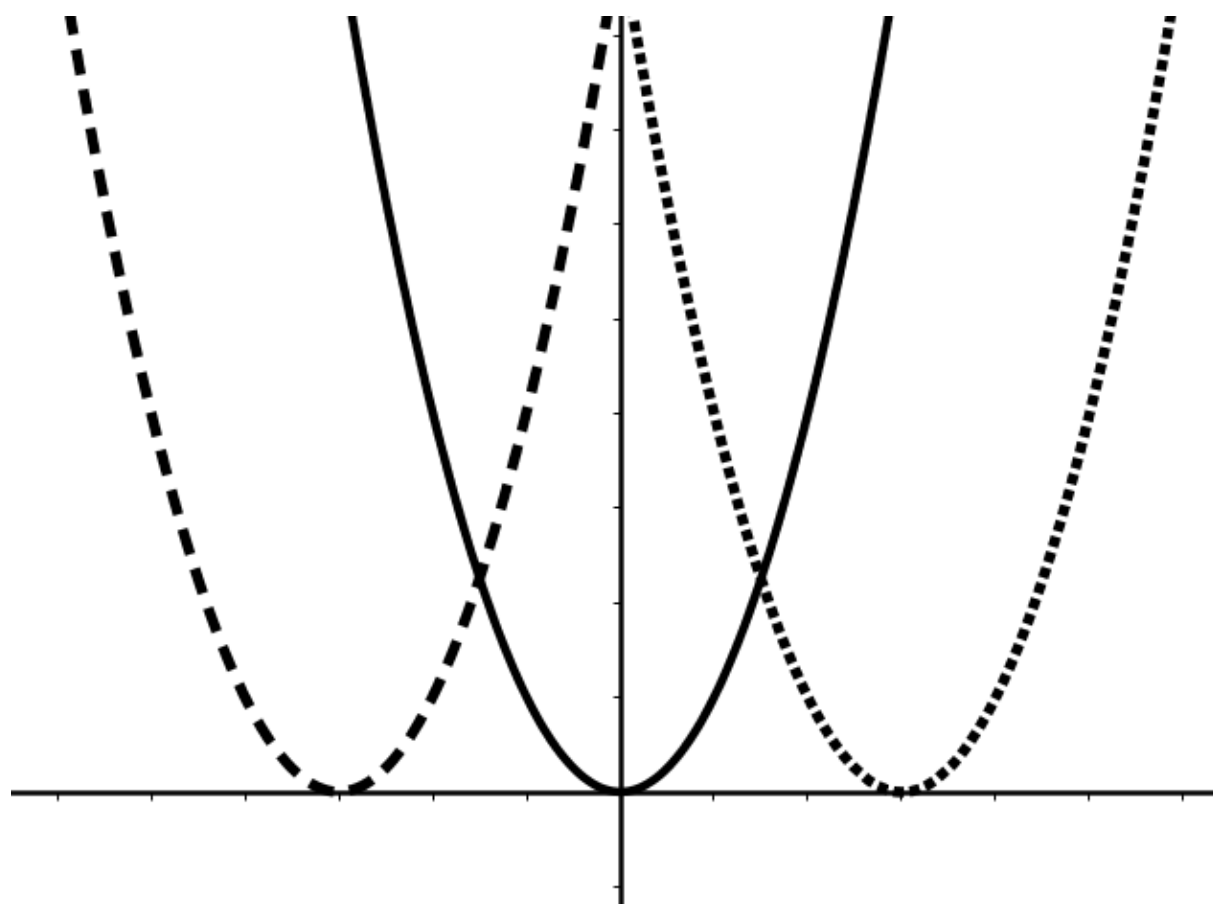
$\frac{1}{2} m v a = \frac{1}{2} m v \frac{dv}{dt} = \frac{1}{2} m \frac{d}{dt} \left( \frac{1}{2} v^2 \right)$

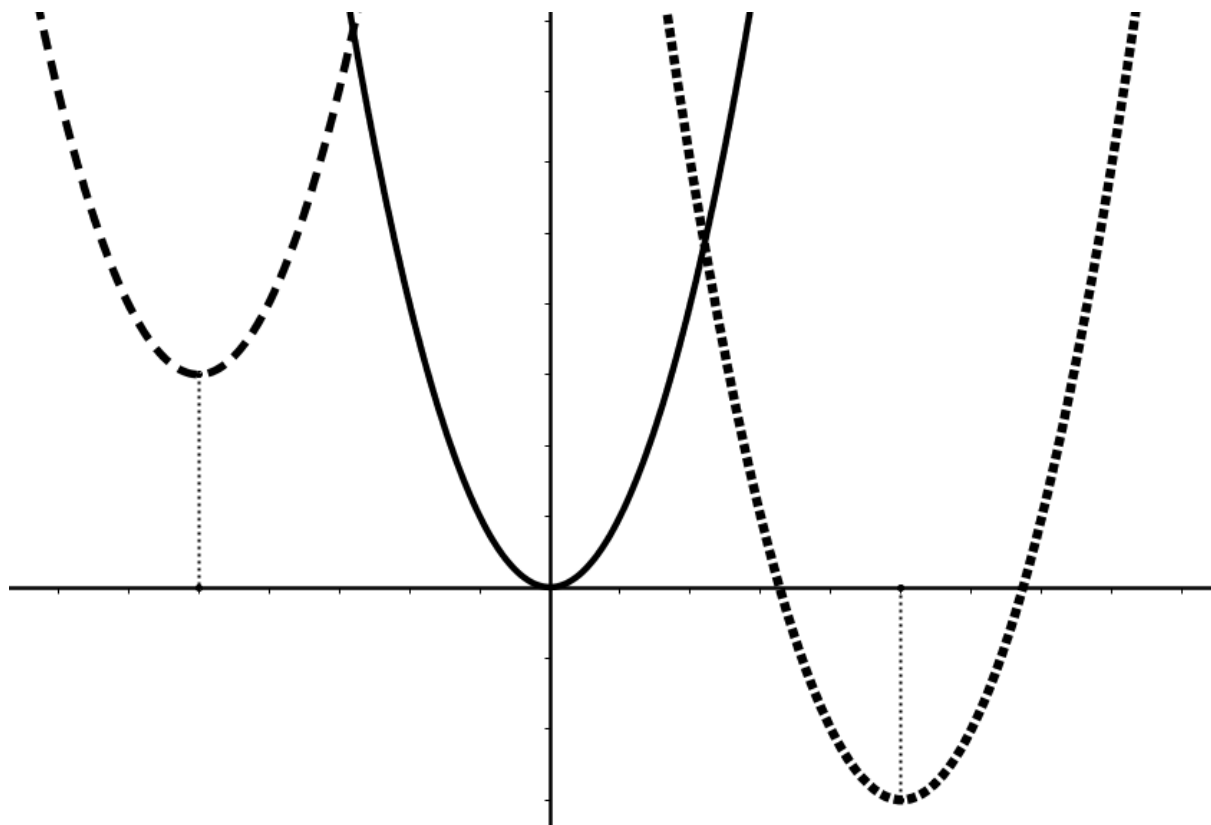
$\frac{1}{2} m \frac{d}{dt} \left( \frac{1}{2} v^2 \right) = \frac{1}{2} m \frac{d}{dt} \left( \frac{1}{2} v^2 \right)$

$\frac{1}{2} m \frac{d}{dt} \left( \frac{1}{2} v^2 \right) = \frac{1}{2} m \frac{d}{dt} \left( \frac{1}{2} v^2 \right)$

$\frac{1}{2} m \frac{d}{dt} \left( \frac{1}{2} v^2 \right) = \frac{1}{2} m \frac{d}{dt} \left( \frac{1}{2} v^2 \right)$

$\frac{1}{2} m \frac{d}{dt} \left( \frac{1}{2} v^2 \right) = \frac{1}{2} m \frac{d}{dt} \left( \frac{1}{2} v^2 \right)$



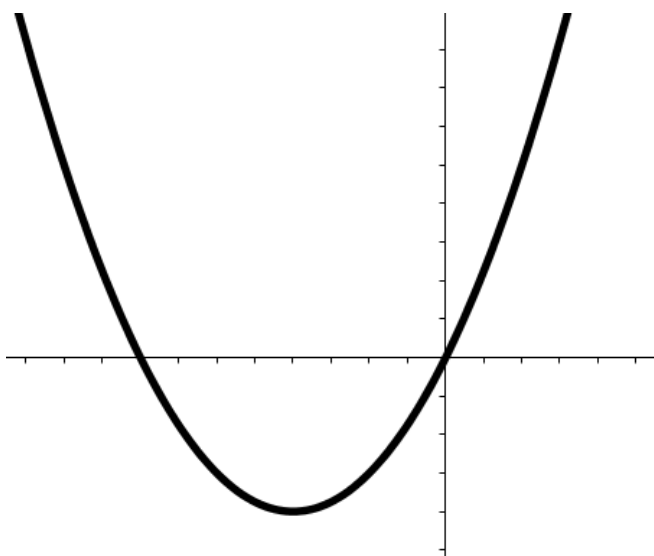


$\frac{1}{2}x^2 + 3x + \frac{5}{2}$       $\frac{1}{2}x^2 + 3x + \frac{5}{2}$       $\frac{1}{2}x^2 + 3x + \frac{5}{2}$

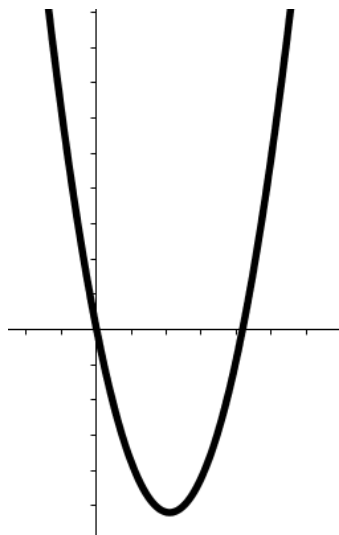
$\frac{1}{2}x^2 + 3x + \frac{5}{2}$       $\frac{1}{2}x^2 + 3x + \frac{5}{2}$       $\frac{1}{2}x^2 + 3x + \frac{5}{2}$       $\frac{1}{2}x^2 + 3x + \frac{5}{2}$

$\frac{1}{2}x^2 + 3x + \frac{5}{2}$       $\frac{1}{2}x^2 + 3x + \frac{5}{2}$       $\frac{1}{2}x^2 + 3x + \frac{5}{2}$

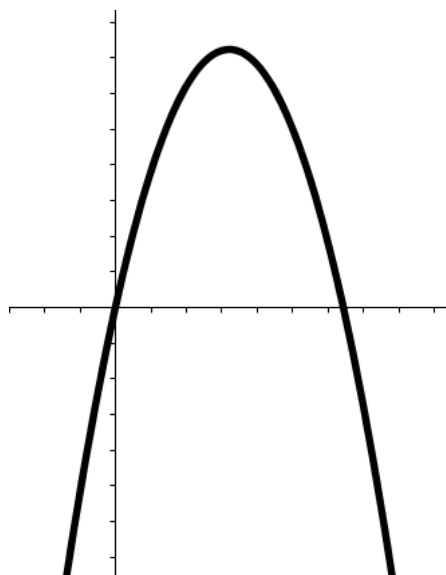
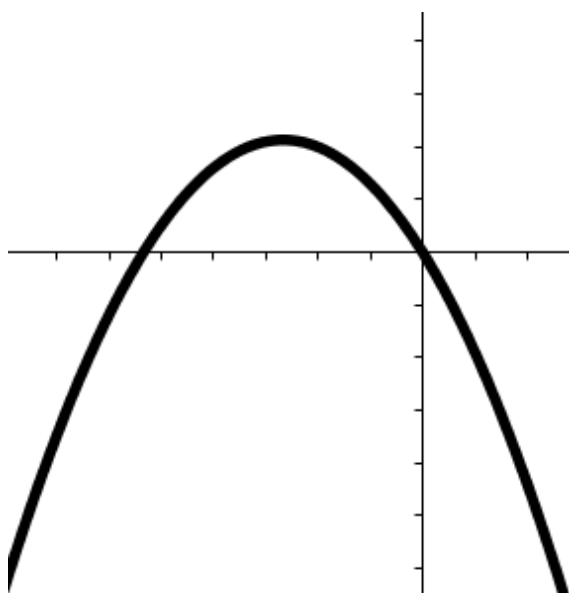
$\frac{1}{2}x^2 + 3x + \frac{5}{2}$       $\frac{1}{2}x^2 + 3x + \frac{5}{2}$       $\frac{1}{2}x^2 + 3x + \frac{5}{2}$



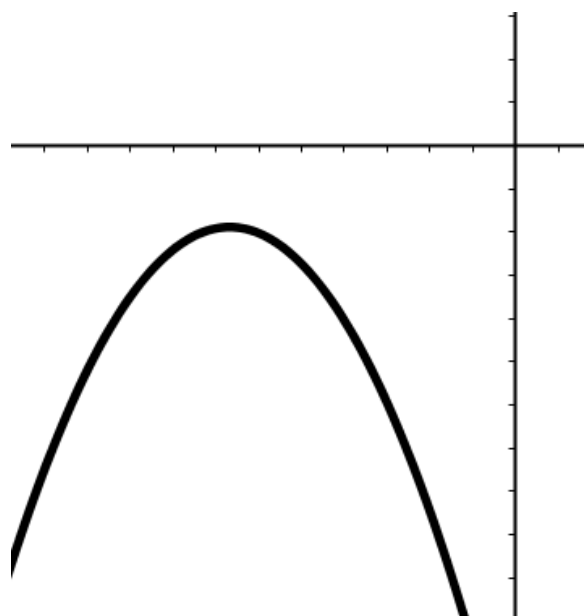
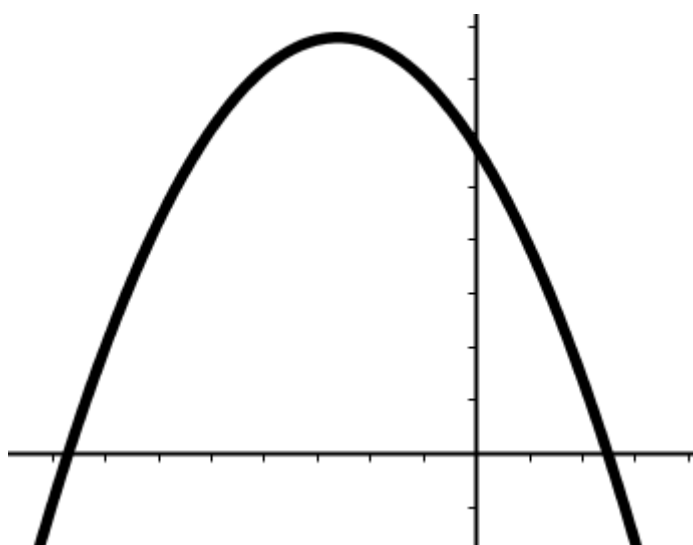
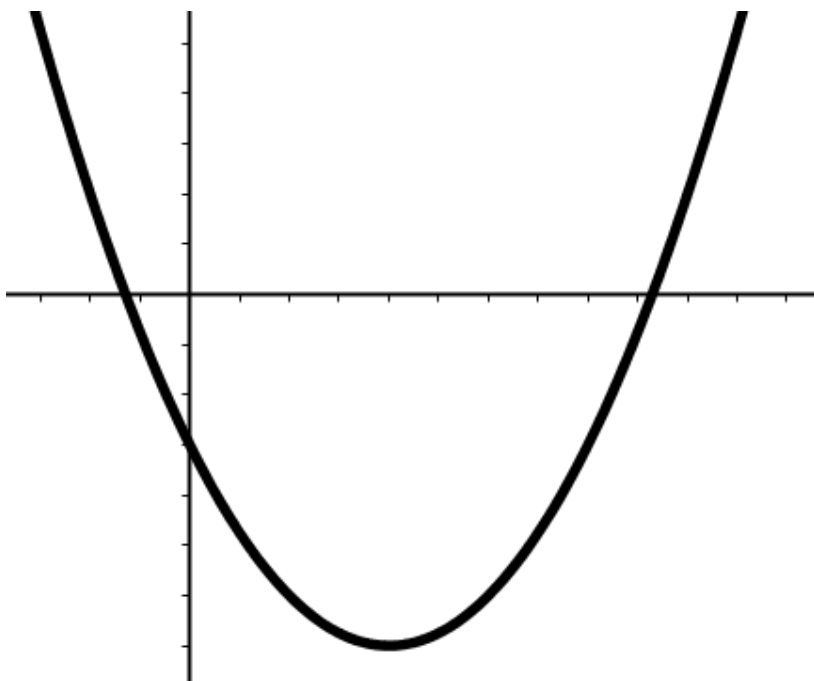
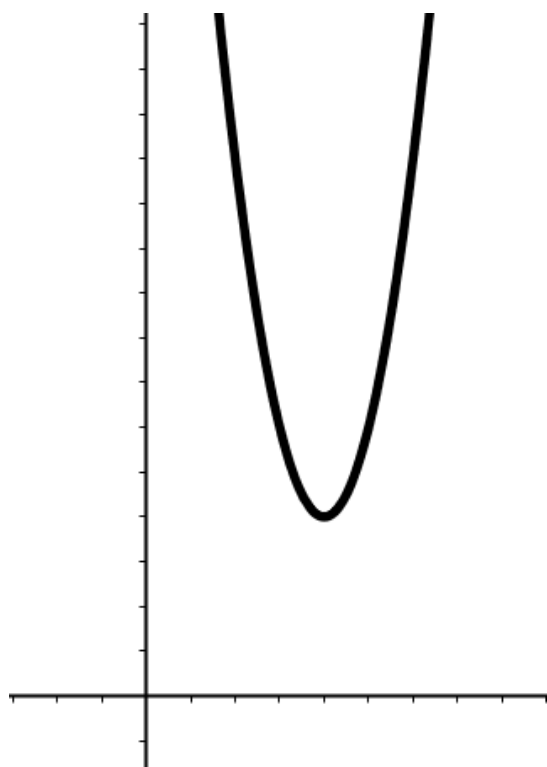
$\frac{1}{2}x^2 + 3x + \frac{5}{2}$       $\frac{1}{2}x^2 + 3x + \frac{5}{2}$



$\frac{1}{2}x^2 + 3x + \frac{5}{2}$       $\frac{1}{2}x^2 + 3x + \frac{5}{2}$



1. Bestimmen Sie die Nullstellen der Funktion  $f(x) = x^2 - 5x + 6$ .  
 2. Skizzieren Sie den Graphen der Funktion  $f(x) = x^2 - 5x + 6$ .  
 3. Berechnen Sie das Minimum der Funktion  $f(x) = x^2 - 5x + 6$ .  
 4. Skizzieren Sie den Graphen der Funktion  $f(x) = x^2 - 5x + 6$ .  
 5. Berechnen Sie das Maximum der Funktion  $f(x) = x^2 - 5x + 6$ .  
 6. Skizzieren Sie den Graphen der Funktion  $f(x) = x^2 - 5x + 6$ .  
 7. Berechnen Sie das Minimum der Funktion  $f(x) = x^2 - 5x + 6$ .  
 8. Skizzieren Sie den Graphen der Funktion  $f(x) = x^2 - 5x + 6$ .  
 9. Berechnen Sie das Maximum der Funktion  $f(x) = x^2 - 5x + 6$ .  
 10. Skizzieren Sie den Graphen der Funktion  $f(x) = x^2 - 5x + 6$ .

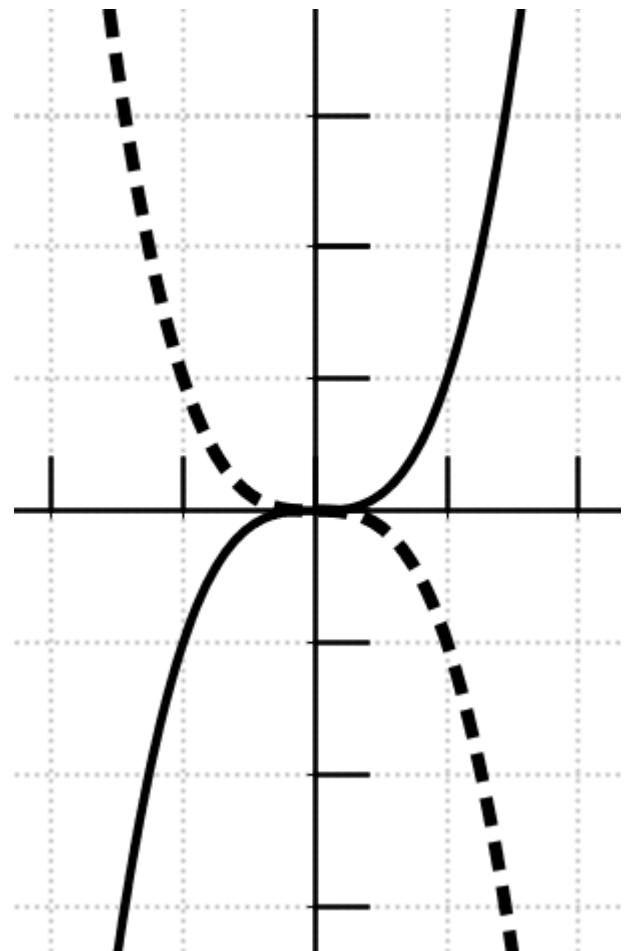
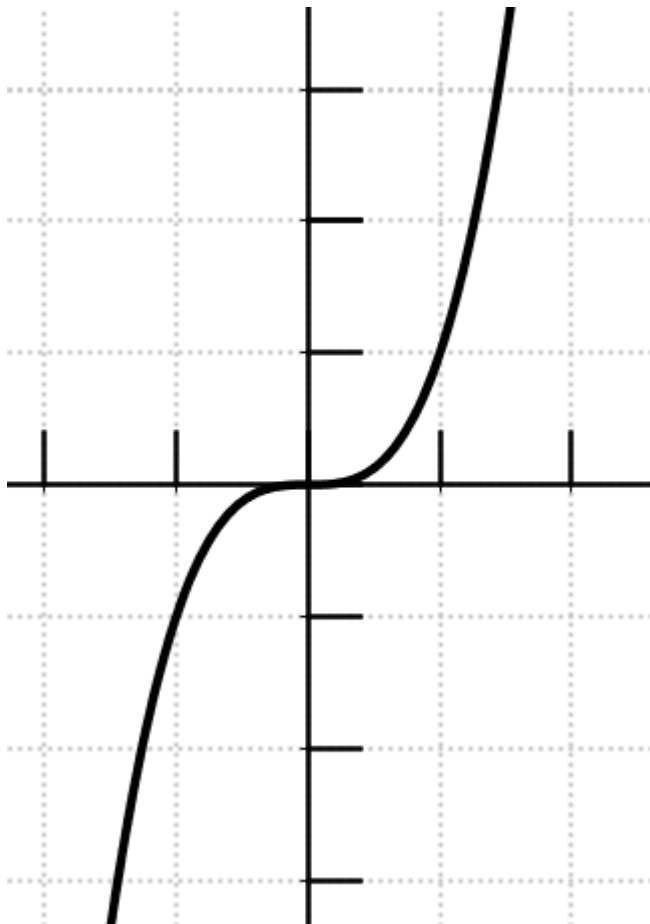


$\lim_{x \rightarrow \infty} \frac{1}{x} = 0$

$\lim_{x \rightarrow \infty} \frac{1}{x^2} = 0$

$\lim_{x \rightarrow \infty} \frac{1}{x^3} = 0$

$\lim_{x \rightarrow \infty} \frac{1}{x^4} = 0$



$\frac{1}{x^2} = x^{-2}$

$\frac{d}{dx} x^{-2} = -2x^{-3}$

$= -2x^{-3}$

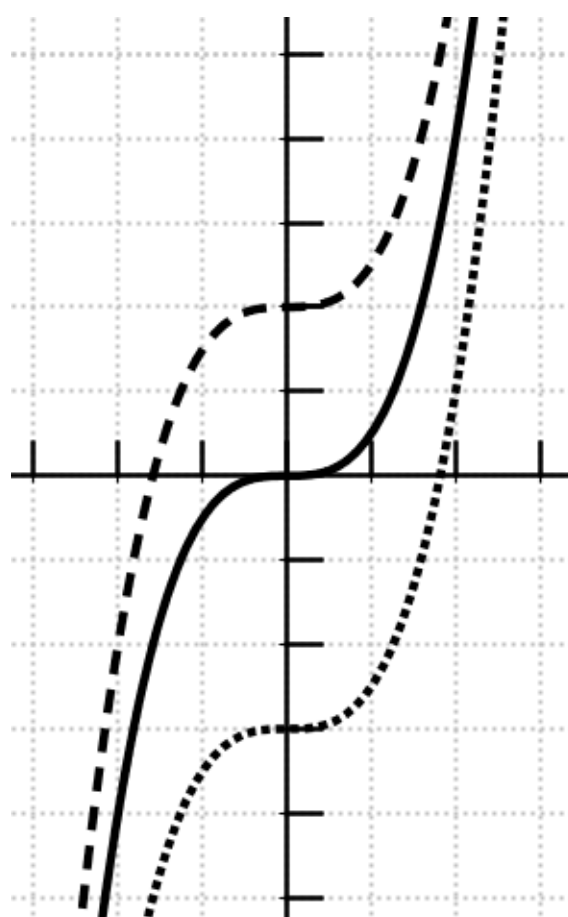
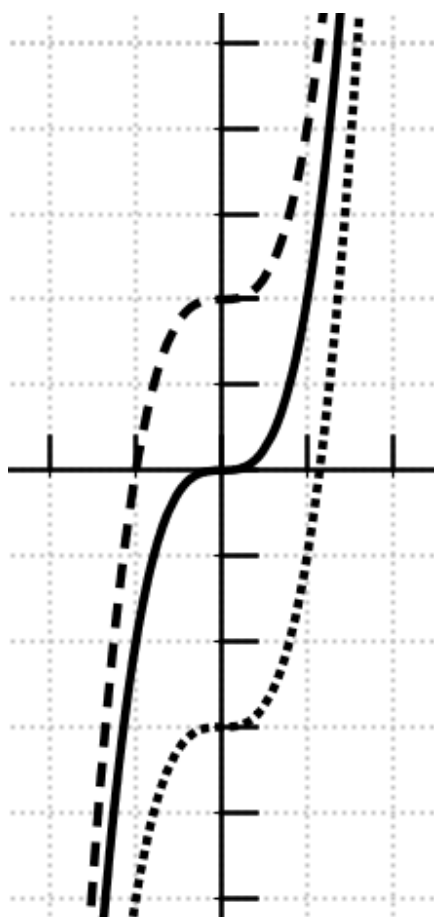
$= -2x^{-3}$

$= -\frac{2}{x^3}$

$= -\frac{2}{x^3}$

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$= -\frac{2}{x^3}$







$\frac{1}{x^2} = x^{-2}$

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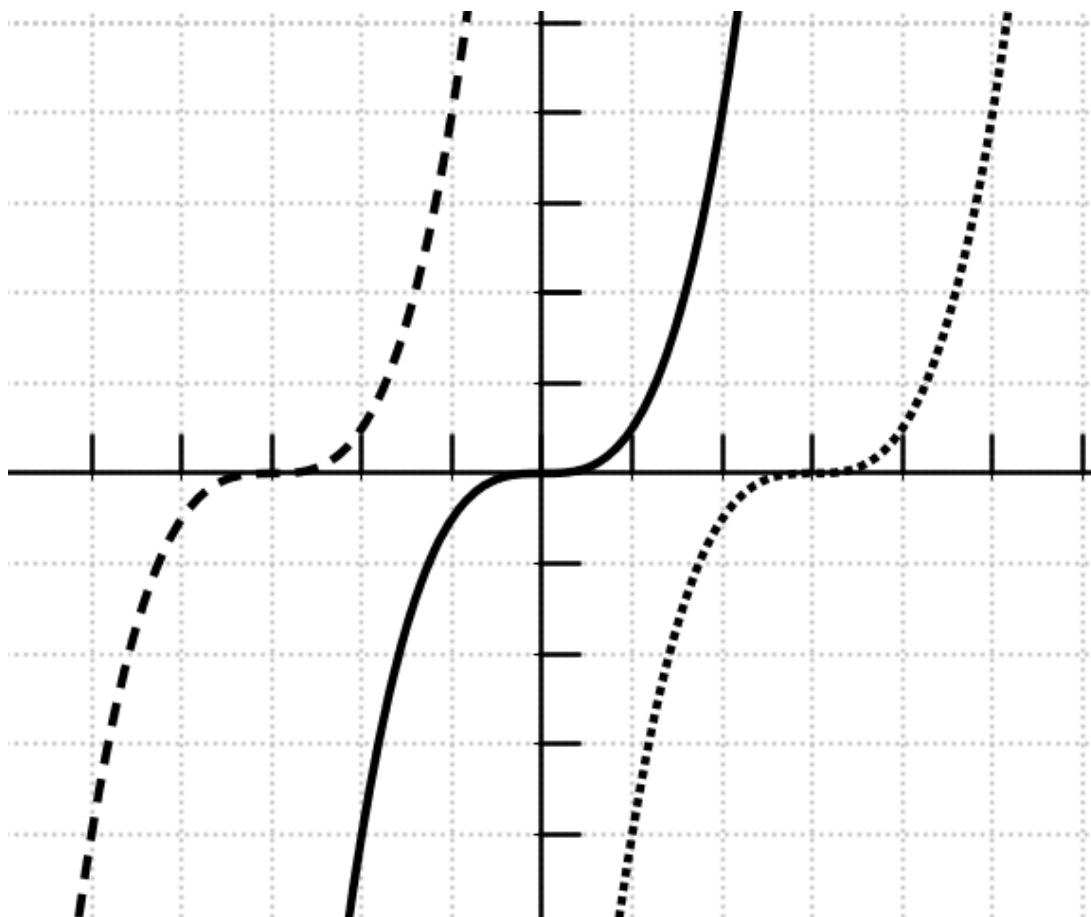
$\frac{1}{x^4} = x^{-4}$

$\frac{1}{x^5} = x^{-5}$

$\frac{1}{x^6} = x^{-6}$

$\frac{1}{x^7} = x^{-7}$

$\frac{1}{x^8} = x^{-8}$



$\frac{1}{x^2} = x^{-2}$

$\frac{1}{x^2} = x^{-2}$

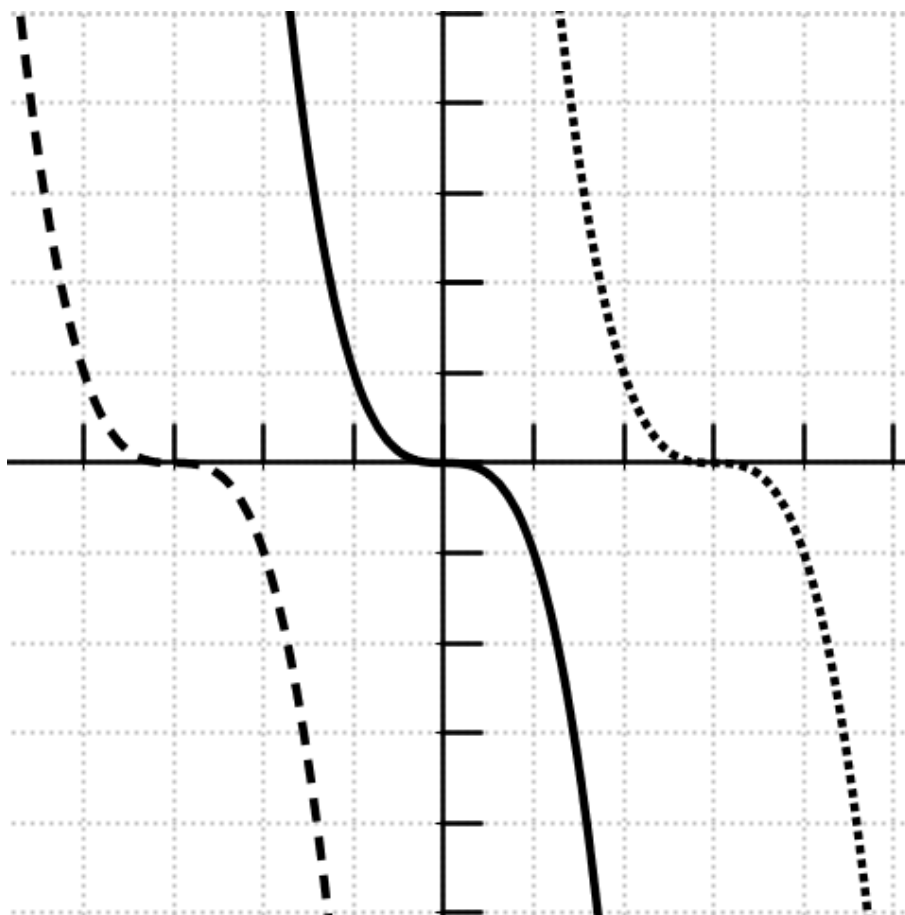
$\frac{1}{x^2} = x^{-2}$

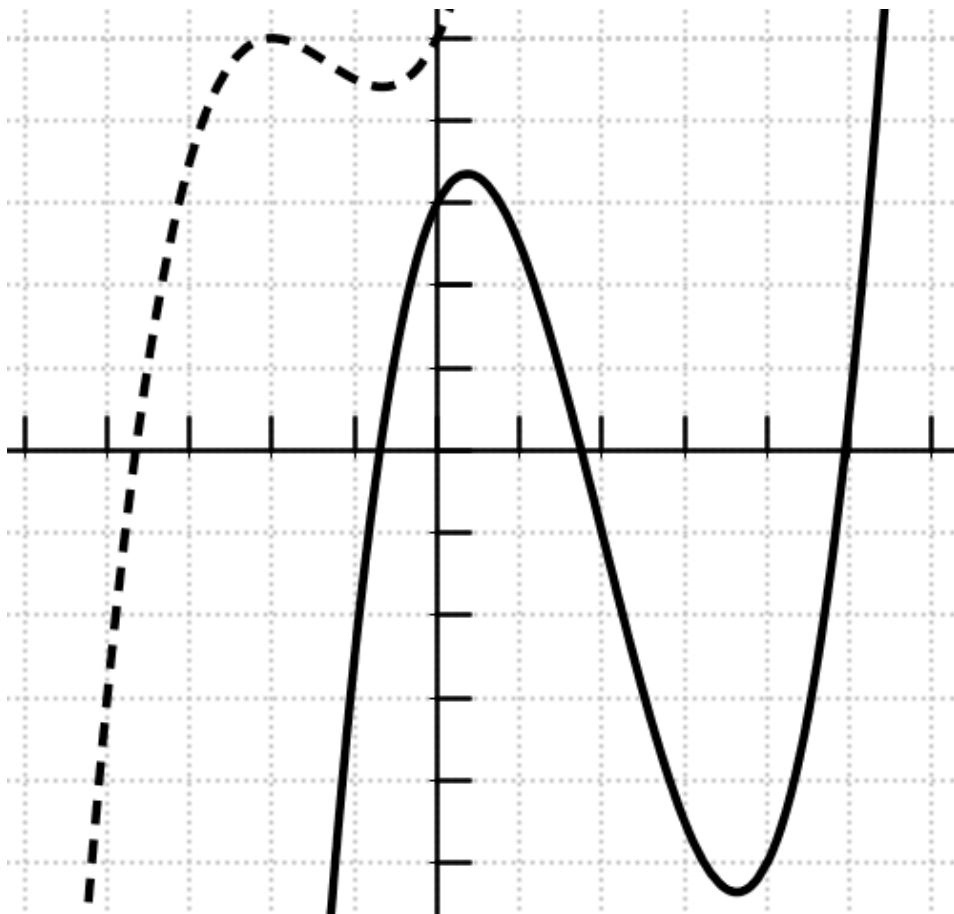
$\frac{1}{x^2} = x^{-2}$

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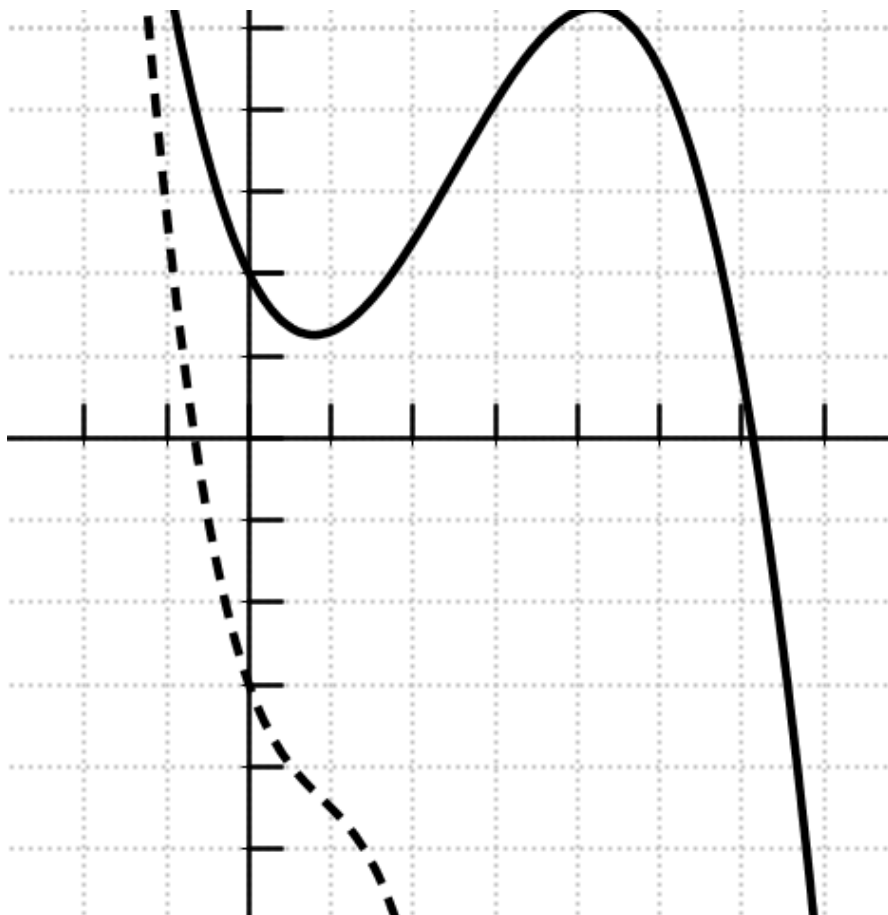
$\frac{1}{x^2} = x^{-2}$

$\frac{1}{x^2} = x^{-2}$





The figure consists of 10 sub-diagrams arranged horizontally, showing a sequence of dot patterns. Each diagram is a grid of dots, with some dots being black and others white. The sequence shows a transformation from a complex, somewhat irregular shape on the left to a simpler, more regular shape on the right. The dots are arranged in a way that suggests a cellular automaton or a similar discrete-time dynamical system.





$\frac{1}{x^2} = x^{-2} \Rightarrow \frac{d}{dx} x^{-2} = -2x^{-3} = -\frac{2}{x^3}$

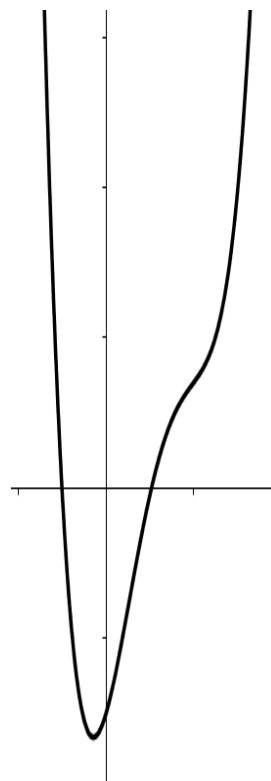
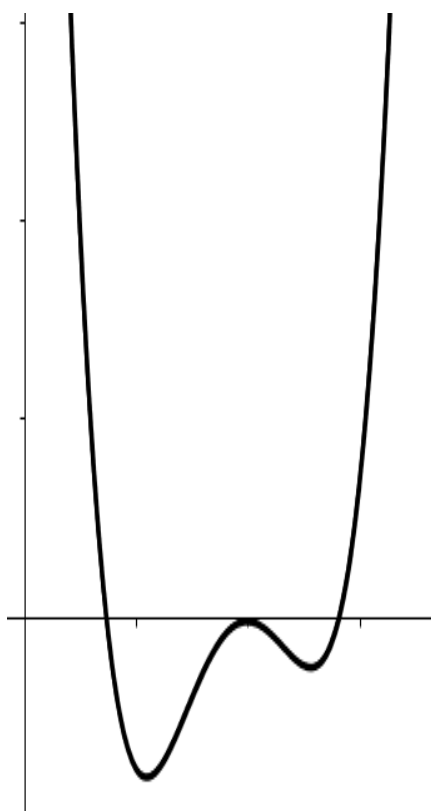
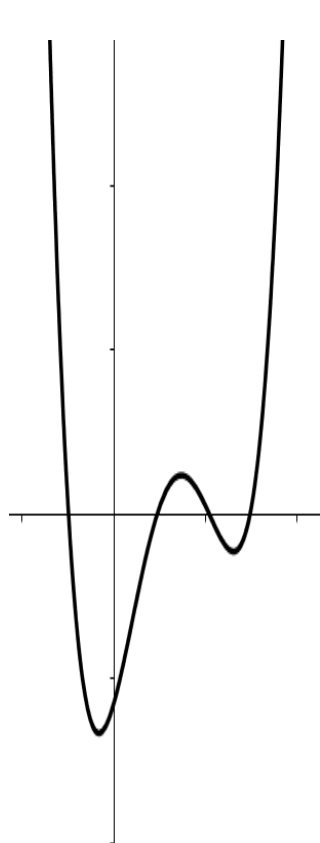
$\frac{d}{dx} \frac{1}{x^2} = -\frac{2}{x^3}$

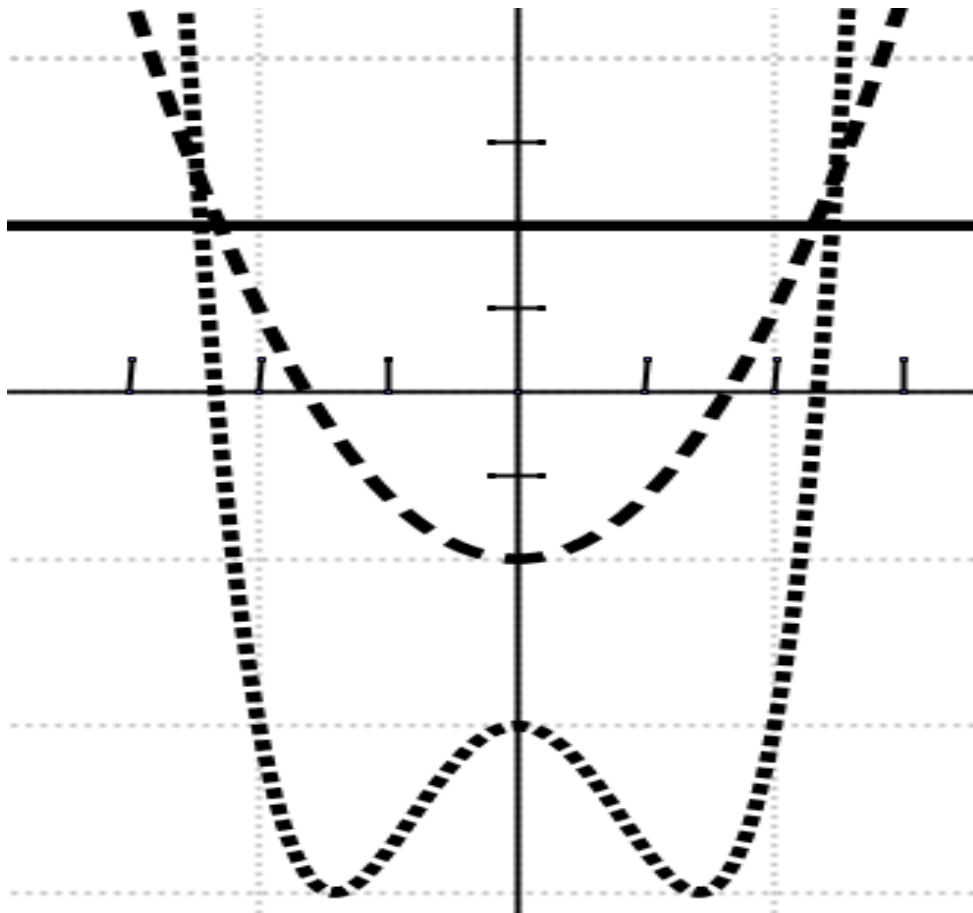
$\frac{d}{dx} \frac{1}{x^2} = -\frac{2}{x^3}$

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$\frac{d}{dx} \frac{1}{x^2} = -\frac{2}{x^3}$

$\frac{d}{dx} \frac{1}{x^2} = -\frac{2}{x^3}$







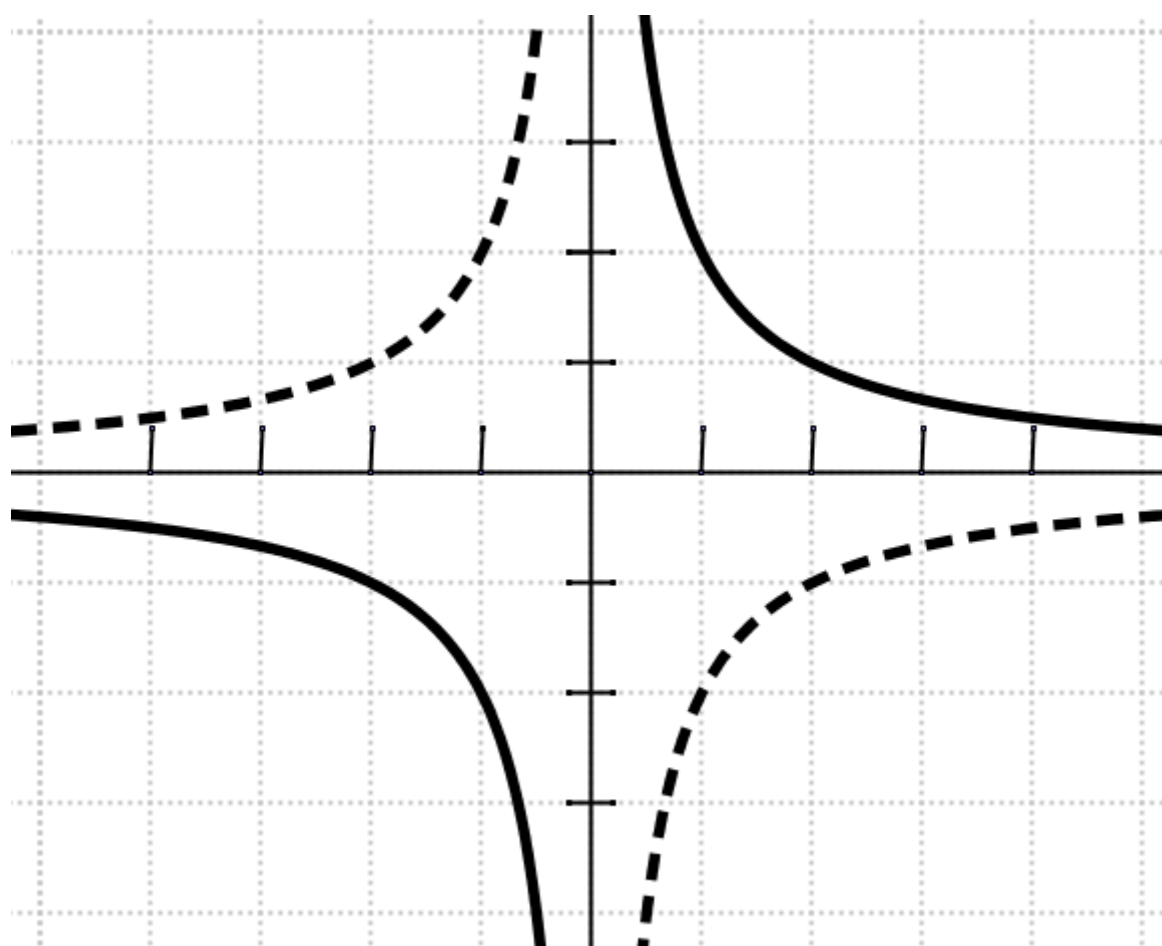


$\frac{1}{x^2}$     $\frac{1}{x}$     $\ln|x|$     $\frac{1}{x^3}$     $\frac{1}{x^4}$     $\frac{1}{x^5}$     $\frac{1}{x^6}$     $\frac{1}{x^7}$     $\frac{1}{x^8}$     $\frac{1}{x^9}$     $\frac{1}{x^{10}}$

$\frac{1}{x^{11}}$     $\frac{1}{x^{12}}$     $\frac{1}{x^{13}}$     $\frac{1}{x^{14}}$     $\frac{1}{x^{15}}$     $\frac{1}{x^{16}}$     $\frac{1}{x^{17}}$     $\frac{1}{x^{18}}$     $\frac{1}{x^{19}}$     $\frac{1}{x^{20}}$

$\frac{1}{x^{21}}$     $\frac{1}{x^{22}}$     $\frac{1}{x^{23}}$     $\frac{1}{x^{24}}$     $\frac{1}{x^{25}}$     $\frac{1}{x^{26}}$     $\frac{1}{x^{27}}$     $\frac{1}{x^{28}}$     $\frac{1}{x^{29}}$     $\frac{1}{x^{30}}$

$\frac{1}{x^{31}}$     $\frac{1}{x^{32}}$     $\frac{1}{x^{33}}$     $\frac{1}{x^{34}}$     $\frac{1}{x^{35}}$     $\frac{1}{x^{36}}$     $\frac{1}{x^{37}}$     $\frac{1}{x^{38}}$     $\frac{1}{x^{39}}$     $\frac{1}{x^{40}}$

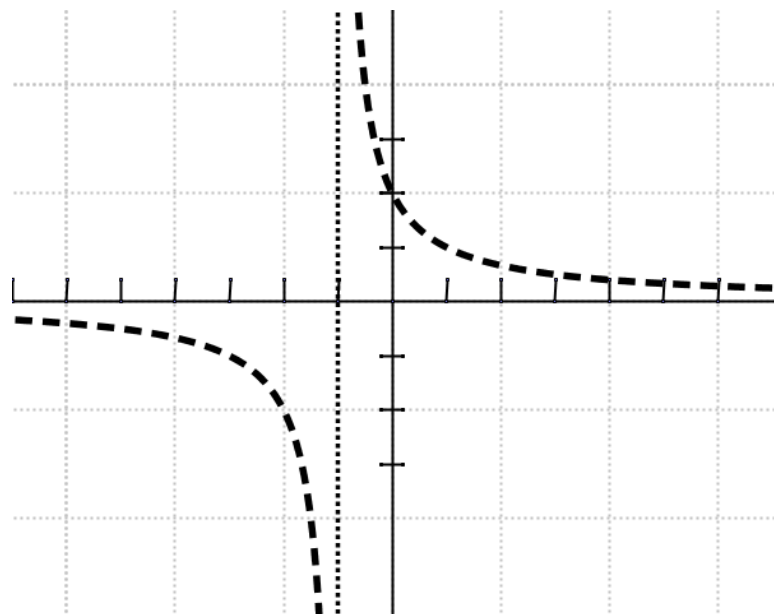
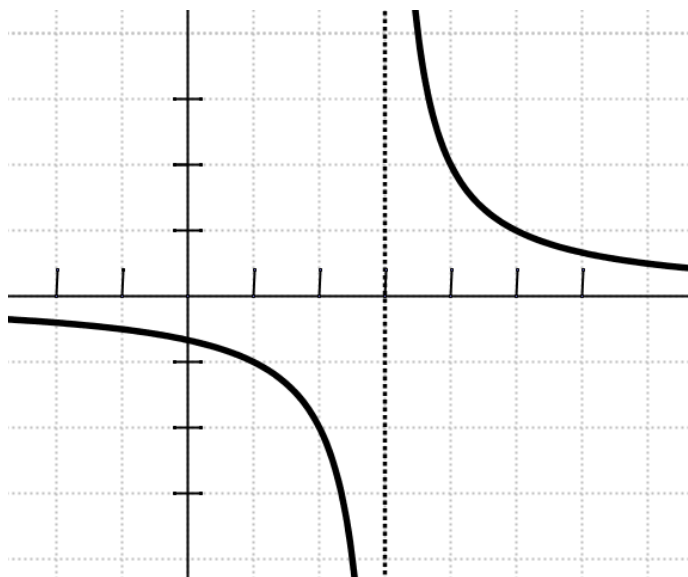


$\frac{1}{x}$      $\frac{1}{x^2}$      $\frac{1}{x^3}$      $\frac{1}{x^4}$      $\frac{1}{x^5}$      $\frac{1}{x^6}$      $\frac{1}{x^7}$      $\frac{1}{x^8}$      $\frac{1}{x^9}$      $\frac{1}{x^{10}}$

$\frac{1}{x^{11}}$      $\frac{1}{x^{12}}$      $\frac{1}{x^{13}}$      $\frac{1}{x^{14}}$      $\frac{1}{x^{15}}$      $\frac{1}{x^{16}}$      $\frac{1}{x^{17}}$      $\frac{1}{x^{18}}$      $\frac{1}{x^{19}}$      $\frac{1}{x^{20}}$

$\frac{1}{x^{21}}$      $\frac{1}{x^{22}}$      $\frac{1}{x^{23}}$      $\frac{1}{x^{24}}$      $\frac{1}{x^{25}}$      $\frac{1}{x^{26}}$      $\frac{1}{x^{27}}$      $\frac{1}{x^{28}}$      $\frac{1}{x^{29}}$      $\frac{1}{x^{30}}$

$\frac{1}{x^{31}}$      $\frac{1}{x^{32}}$      $\frac{1}{x^{33}}$      $\frac{1}{x^{34}}$      $\frac{1}{x^{35}}$      $\frac{1}{x^{36}}$      $\frac{1}{x^{37}}$      $\frac{1}{x^{38}}$      $\frac{1}{x^{39}}$      $\frac{1}{x^{40}}$



$\frac{1}{x^2}$     $\frac{1}{x}$     $\ln|x|$     $\frac{1}{x^3}$

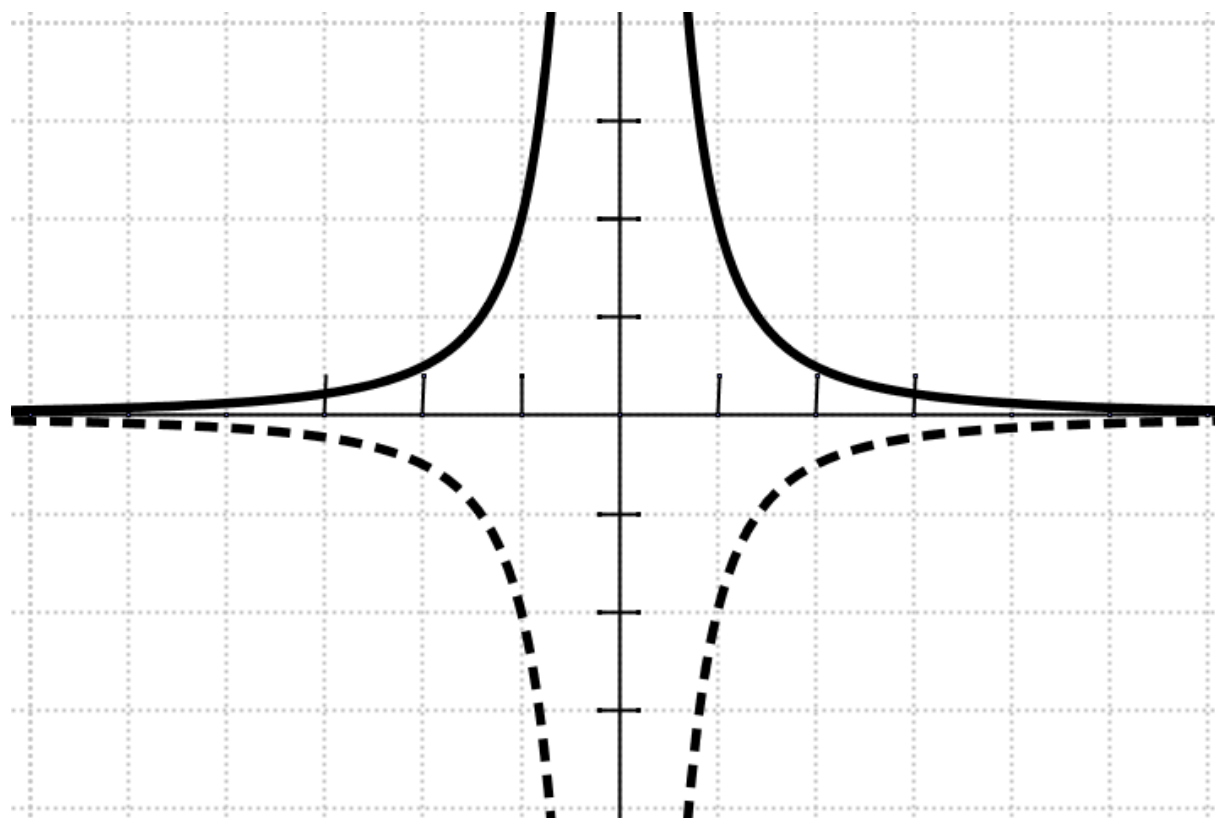
$\frac{1}{x^4}$     $\frac{1}{x^5}$     $\frac{1}{x^6}$     $\frac{1}{x^7}$

$\frac{1}{x^8}$

$\frac{1}{x^9}$

$\frac{1}{x^{10}}$

$\frac{1}{x^{11}}$

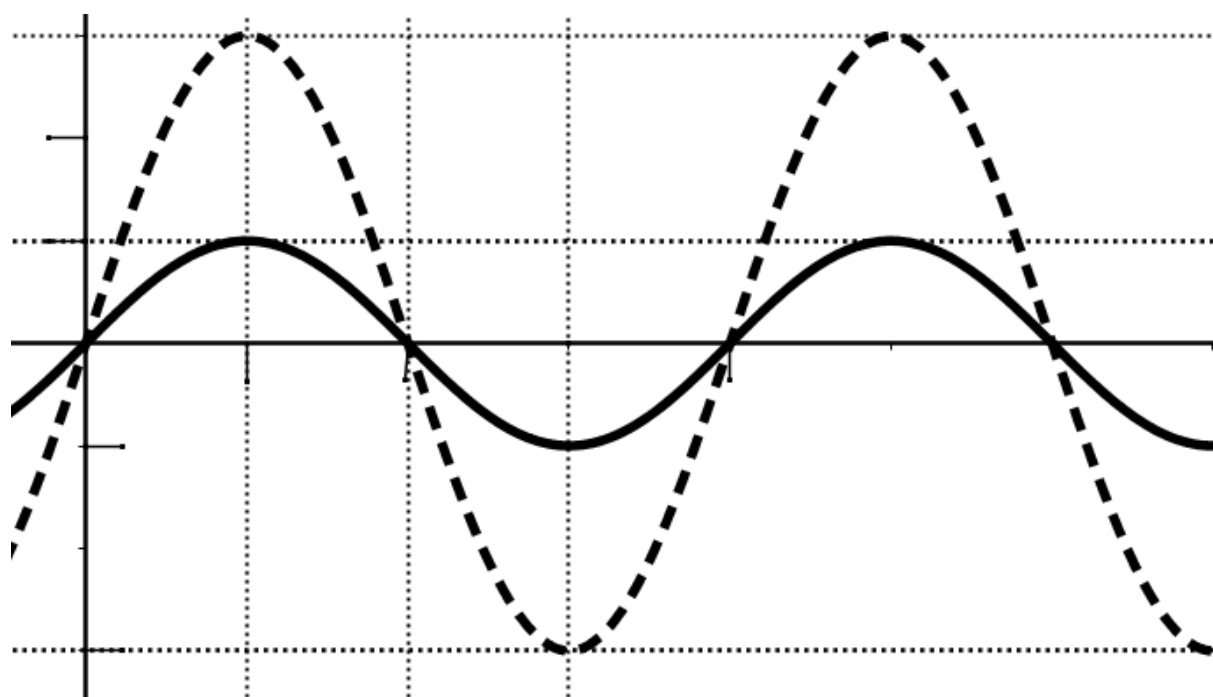




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1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100.

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- 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100.



$\frac{1}{2} \sin\left(\frac{\pi}{2}x\right) + \frac{1}{2} \cos\left(\frac{\pi}{2}x\right)$

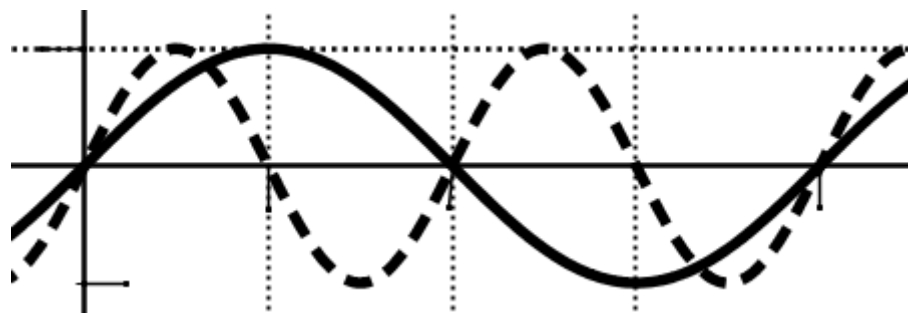
$\frac{1}{2} \sin\left(\frac{\pi}{2}x\right) + \frac{1}{2} \cos\left(\frac{\pi}{2}x\right)$

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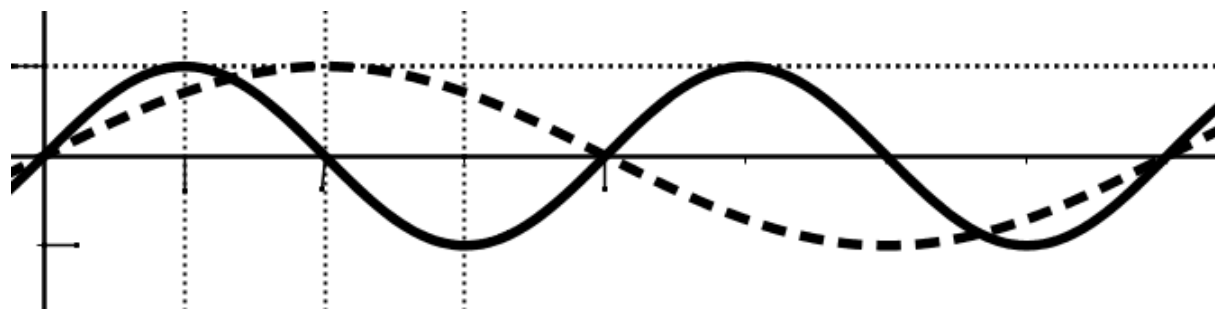


$\frac{1}{2} \sin\left(\frac{\pi}{2}x\right) + \frac{1}{2} \cos\left(\frac{\pi}{2}x\right)$

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$\frac{1}{2} \sin\left(\frac{\pi}{2}x\right) + \frac{1}{2} \cos\left(\frac{\pi}{2}x\right)$



1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100.

1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100.

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