

Math 115 – Gateway Exam Sample Problems

- $f(x) = x^{7/3} - x^{4/3} + 56$
- $f(x) = 3x^2 - \frac{5}{x^3}$
- $g(t) = t^{2/3} - t^{-1/4} + \pi$
- $f(x) = \frac{2}{3}x^{3/2} - (\sqrt[3]{4})x + \frac{2}{x^2}$
- $f(x) = 12x^3 - 6x + 2 - \frac{2}{x} + 4x^{3/4}$
- $h(r) = 2r^2 + 4r + \frac{1}{r}$
- $f(x) = 2x^{-1/2} - x^{-1}$
- $f(x) = x^4 + 4x^3 + 10$
- $f(x) = 2\frac{2}{3}x^3 + x^2 + 12x + 9$
- $f(x) = 5x^7 - \frac{2}{x} + \sqrt{7}$
- $f(x) = 2x^2 - \frac{9}{x}$
- $f(x) = 3x^{2/3} - 6x^{4/3}$
- $f(x) = x^3/4 + x^{-3/4}$
- $g(t) = t^{4/3} - 4t^{1/3} + 1$
- $f(t) = 2t^3 + 6t - \frac{4}{t^2}$
- $f(x) = x^{5/4} - 10x^{1/4} + 1$
- $f(x) = 2x^{-1} + 3x^2$
- $f(x) = \frac{1}{x} + \frac{1}{x^2} + \frac{1}{x^3}$
- $f(y) = 4y^3 - 6y^{2/3} + 7y$
- $p(x) = 16x^3 + \frac{17}{\sqrt{x}} - 10x^{3.1416} + \pi^2$
- $g(t) = (t^2 - 1)(t^4 + t^2 + 1)$
- $f(x) = (x^2 + 2x + 5)(x^3 + 1)$
- $h(t) = \sqrt{t}(t^2 + 1)$
- $s(t) = (t + 1)(t^2 - 3)(t^3 - 2)$
- $f(x) = x^{-1/2}(1 + x^2 + 3x)$
- $h(x) = (x^{4/5} + x^{-4/5})(5x^4 - 10\pi^2)$
- $f(x) = (x^{2/3} - x^{-1/3})(3x^2 - 6\pi)$
- $f(x) = (x^4 + 6x^2 + 1)(x^3 + 3x)$
- $r(u) = 2u(u^2 + 4)$
- $g(x) = (x^3 - 3x^{1/3} + 5)(x^4 + 5x^2 - 2\sqrt{x})$
- $g(x) = (x^4 - 16)(x^2 - 4)$
- $f(x) = (x^3 + 3x^2 + 2)(x^5 + 6x^2 - 3x + 5)$
- $h(w) = (w^{-1/3} - 3w^6)(4w^2 - 2w + 7)$
- $g(t) = (1 - t)(t^2 + 1)$
- $f(x) = (1 - x^2)(2x^2 + x)$
- $g(y) = (\sqrt{y} - 2)(1 - y^2)$
- $u(x) = (x^2 - 1)(x^2 + 1)(x - 2)$

38. $F(x) = (3x^2 + (\sqrt{7})x - \pi^2) \left(\frac{x^4}{3} - \frac{x^2}{\sqrt{10}} \right)$
39. $G(y) = (3\pi y - 4)(3\pi y + 6)$
40. $H(t) = (2t - 1) \left(4 - .05t + \frac{t^{3/2}}{9.6} \right)$
41. $f(x) = \frac{x - 3}{x^2 + 7}$
42. $k(x) = \frac{3x - 2}{x - 1}$
43. $f(x) = \frac{x + 1 - \sqrt{x}}{x}$
44. $f(x) = \frac{x^4 - 3x^2 + 2}{x^2 - 2}$
45. $f(x) = \frac{x^3 - 1}{\sqrt[3]{x}}$
46. $f(x) = \frac{3x}{1 - 2x^2}$
47. $f(x) = \frac{x^2 - 2x + 4}{x - 2}$
48. $f(x) = \frac{1}{3 - x}$
49. $g(x) = \frac{3x^2 + 1}{x + 2}$
50. $f(t) = \frac{4t^2 + t}{3t + 2}$
51. $f(x) = \frac{3x}{\sqrt{x} + 2}$
52. $g(t) = \frac{t^3 - 3t - 2}{t^2 + 1}$
53. $m(y) = \frac{1 - 4y^2}{6y^2 + 1}$
54. $k(x) = \frac{x^3 - 2x + 4}{2x^2 + 1}$
55. $g(t) = \frac{1 + t + t^2}{t - t^3}$
56. $g(t) = \frac{4 + t^2}{2 - t}$
57. $h(x) = \frac{(x - 1)(x^2 + x + 1)}{x + 1}$
58. $g(y) = \frac{y - 2}{y^2 + 1}$
59. $r(u) = \frac{5 + u^2}{1 - u^3}$
60. $f(x) = \frac{x^2 - 4}{x - 3}$
61. $f(x) = \sqrt{x^2 + x + 1}$
62. $f(x) = \sqrt[3]{x^4 - 7x}$
63. $u(t) = \frac{1}{\sqrt{t^2 + 2t - 1}}$
64. $f(x) = (1 + (x^2 + 2)^{\frac{1}{2}})^{\frac{1}{3}}$
65. $f(x) = (x^4 + 2x^2 + 2)^2$
66. $h(w) = (1 + \sqrt{w^3 + 3})^4$
67. $f(x) = (5x^3 + 5x)^9$
68. $h(s) = \frac{1}{\sqrt{s^2 - s^4}}$
69. $f(t) = \frac{1}{\sqrt{3t^2 + 2t + 2}}$
70. $h(s) = (1 + \sqrt{s})^{-\frac{1}{2}}$
71. $f(x) = ((5x + 1)^2 + 4)^3$
72. $f(x) = (x^2 + 1)^8$
73. $f(x) = \sqrt{3x^2 - x}$
74. $f(x) = (x^2 + 1)^{-10}$
75. $f(x) = \sqrt{1 + x^3}$

76. $g(r) = \frac{1}{\sqrt{r^3 + 2r}}$

77. $h(s) = \frac{1}{\sqrt{1 - s^3}}$

78. $m(u) = \sqrt{1 + \sqrt{u}}$

79. $f(t) = \frac{1}{\sqrt{1 - t^2}}$

80. $h(x) = \sqrt{3x^2 - 2x + 1}$

81. $f(x) = (x^2 + 1)^3(x^2 + 3x + 1)^2$

82. $g(t) = (t^3 - 1)^4(1 + t + t^2)^{-4}$

83. $h(s) = ((s + 2)^3(2 - s))^3$

84. $k(r) = ((r + r^3)(r - r^3))^4$

85. $g(t) = (t^3 - \pi^3)^2(t^2 + \pi^2)^3$

86. $h(y) = (y - 1)^4(1 + y + y^2)^4$

87. $f(x) = (1 - 2x)^3(2x^2 - x)^4$

88. $g(s) = (s - 3)^2(9 + s^2)^{-3}$

89. $h(x) = \sqrt{(x + 1)^2(2x + 3)}$

90. $h(x) = ((4 - x^2)(9 - x))^{\frac{1}{3}}$

91. $f(x) = \frac{5 - x}{2(x - 2)^{\frac{5}{2}}}$

92. $f(x) = (x - 7)^{\frac{1}{3}}(x + 2)^{\frac{1}{5}}$

93. $g(t) = \frac{t}{\sqrt{1 + t^2}}$

94. $h(s) = \sqrt{\frac{s^2 + s - 2}{s + 2}}$

95. $f(x) = \left(\frac{x - 3}{x^2 + 7}\right)^4$

96. $f(x) = \frac{(7x + 1)^{\frac{4}{3}}}{x^2}$

97. $g(u) = \frac{2u - 3}{\sqrt{u^2 - 3u + 4}}$

98. $w(t) = \frac{t^2 - 49}{\sqrt{t + 7}}$

99. $F(y) = \left(\frac{1 - 3y}{4 + y - 2y^2}\right)^2$

100. $f(t) = \left(\frac{2t - 1}{4t - 5}\right)^{1/3}$