

Math 115 – Gateway Exam Sample Problems

1. $f(x) = x^{7/3} - x^{4/3} + 56$
2. $f(x) = 3x^2 - \frac{5}{x^3}$
3. $g(t) = t^{2/3} - t^{-1/4} + \pi$
4. $f(x) = \frac{2}{3}x^{3/2} - (\sqrt[3]{4})x + \frac{2}{x^2}$
5. $f(x) = 12x^3 - 6x + 2 - \frac{2}{x} + 4x^{3/4}$
6. $h(r) = 2r^2 + 4r + \frac{1}{r}$
7. $f(x) = 2x^{-1/2} - x^{-1}$
8. $f(x) = x^4 + 4x^3 + 10$
9. $f(x) = 2\frac{2}{3}x^3 + x^2 + 12x + 9$
10. $f(x) = 5x^7 - \frac{2}{x} + \sqrt{7}$
11. $f(x) = 2x^2 - \frac{9}{x}$
12. $f(x) = 3x^{2/3} - 6x^{4/3}$
13. $f(x) = x^3/4 + x^{-3/4}$
14. $g(t) = t^{4/3} - 4t^{1/3} + 1$
15. $f(t) = 2t^3 + 6t - \frac{4}{t^2}$
16. $f(x) = x^{5/4} - 10x^{1/4} + 1$
17. $f(x) = 2x^{-1} + 3x^2$
18. $f(x) = \frac{1}{x} + \frac{1}{x^2} + \frac{1}{x^3}$
19. $f(y) = 4y^3 - 6y^{2/3} + 7y$
20. $p(x) = 16x^3 + \frac{17}{\sqrt{x}} - 10x^{3.1416} + \pi^2$
21. $g(t) = (t^2 - 1)(t^4 + t^2 + 1)$
22. $f(x) = (x^2 + 2x + 5)(x^3 + 1)$
23. $h(t) = \sqrt{t}(t^2 + 1)$

24. $s(t) = (t + 1)(t^2 - 3)(t^3 - 2)$
25. $f(x) = x^{-1/2}(1 + x^2 + 3x)$
26. $h(x) = (x^{4/5} + x^{-4/5})(5x^4 - 10\pi^2)$
27. $f(x) = (x^{2/3} - x^{-1/3})(3x^2 - 6\pi)$
28. $f(x) = (x^4 + 6x^2 + 1)(x^3 + 3x)$
29. $r(u) = 2u(u^2 + 4)$
30. $g(x) = (x^3 - 3x^{1/3} + 5)(x^4 + 5x^2 - 2\sqrt{x})$
31. $g(x) = (x^4 - 16)(x^2 - 4)$
32. $f(x) = (x^3 + 3x^2 + 2)(x^5 + 6x^2 - 3x + 5)$
33. $h(w) = (w^{-1/3} - 3w^6)(4w^2 - 2w + 7)$
34. $g(t) = (1 - t)(t^2 + 1)$
35. $f(x) = (1 - x^2)(2x^2 + x)$
36. $g(y) = (\sqrt{y} - 2)(1 - y^2)$
37. $u(x) = (x^2 - 1)(x^2 + 1)(x - 2)$
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.

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