Math 1643 Exam Three (Sample) Fall, 2013

Multiple choice.

For questions 1 through 4, use the function $y = \frac{12 - 6x}{2x - 3}$

1) The vertical asymptote is:

A) $x = 2$ **B)** $x = 6$ **C)** $x = \frac{3}{2}$ **D)** $x = -3$ **E)** $x = -4$

2) The horizontal asymptote is:

A) $y = 2$ **B)** $y = 6$ **C)** $y = \frac{3}{2}$ **D)** $y = -3$ **E)** $y = -4$

3) The x – intercept is:

A) $(2, 0)$ **B)** $(6, 0)$ **C)** $(\frac{3}{2}, 0)$ **D)** $(-3, 0)$ **E)** $(-4, 0)$

4) The y – intercept is:

A) $(0, 2)$ **B)** $(0, 6)$ **C)** $(0, \frac{3}{2})$ **D)** $(0, -3)$ **E)** $(0, -4)$

5) Write as one logarithm: $-3 \log t - \frac{1}{2} \log x + 3 \log 2 - \log 7$

A) $\log\left(\frac{6}{7\ t^3\ \sqrt{x}}\right)$ **B)** $\log\left(\frac{8}{7\ t^3\ \sqrt{x}}\right)$ **C)** $\log\left(\frac{9}{21\ t\sqrt{x}}\right)$ **D)** $\log\left(\frac{8}{21\ t\ \sqrt{x}}\right)$

6) Expand: $\ln\left(\frac{11\ x^2}{9\ \sqrt{y}\ t^5}\right)$

A) $22 \ln x - \frac{9}{2} \ln y - 5 \ln t$ **B)** $22 \ln x - \ln 9 - \frac{1}{2} \ln y - 5 \ln t$

C) $\ln 11 + 2 \ln x - \ln 9 - \frac{1}{2} \ln y - 5 \ln t$ **D)** $\ln 22 + \ln x - \ln 9 - \ln \frac{y}{2} - 5 \ln t$

7) Write $log\sqrt{T}$ **= M as an exponential.**

A) $10^{\sqrt{T}}$ **= M** **B)** $10^{M} = \sqrt{T}$ **C)** $M^{\sqrt{T}} = 10$ **D)** $\sqrt{T}^{10}$ **= M**

8) Write $7^{T} = Y$ **as a logarithm.**

A) $\log_7 Y = T$ **B)** $\log_7 T = Y$ **C)** $\log_Y T = 7$ **D)** $\log_T Y = 7$

9) What is the maximum y-value for the quadratic: $y = -3x^2 - 24x + 47$ **?**

A) – 4 **B) – 8** **C) 287** **D) 95** **E) 47**

10) What is the degree of this polynomial: $P(x) = 2x^6 - 7x^4 + x^3 - 9x^8 + x$ **?**

A) 6 **B) 22** **C) 8** **D) – 9** **E) 2**

11) What is the domain of $y = 11 - \ln\left(\frac{1}{3}x - 8\right)$ **?**

A) $[24, \infty)$ **B)** $(24, \infty)$ **C)** $(\frac{8}{3}, \infty)$ **D)** $(-\infty, 24]$

12) Which of the following is a polynomial?

A) $4x^2 + \sqrt{x} + 11$ **B)** $5x - \frac{2}{x} + 1$ **C)** $5x^4 - 9x^3 + 8x^{-2} + 13$

D) $\frac{x^2 - x - 8}{2x + 11}$ **E)** $x^2 + \frac{x}{4} + 8$

13) Find the complete solution set for $2^{3x+8} = 4^{x+7}$

A) $\{\frac{15}{2}\}$ **B) { 6 }** **C) { - 1 }** **D)** $\{-\frac{1}{2}\}$ **E) { 22 }**

14) Find the vertex of the parabola: $y = 8x - \frac{1}{2}x^2 + 19$

A) $\left(\frac{1}{32}, \frac{39423}{2048}\right)$ B) $\left(-\frac{1}{32}, \frac{38399}{2048}\right)$ C) $(8, 51)$ D) $(-8, -77)$

15) If T varies inversely as the square of Y and directly as the square root of X, then which equation is correct?

A) $T = \frac{k\,Y^2}{\sqrt{X}}$ B) $T = \frac{k\sqrt{X}}{Y^2}$ C) $T = \frac{k\,x^2}{\sqrt{Y}}$ D) $T = \frac{k}{Y^2\sqrt{X}}$

16) Evaluate: $\log_b \frac{1}{\sqrt{b}} + \log_b b^3 + \log_b \left(\frac{1}{b^2}\right)$

A) $\frac{1}{2}$ B) $-\frac{1}{2}$ C) $\frac{3}{2}$ D) $-\frac{3}{2}$ E) 0

17) What is the y-intercept of $y = 2 + 10\log_b(3x + \sqrt{b})$

A) $(0, 22)$ B) $(0, 7)$ C) $(0, 12)$ D) $(0, 2)$ E) $(0, 102)$

18) Which of the following is a zero of $P(x) = 2x^3 - x^2 - 4x - 4$?

A) 1 B) -2 C) 4 D) 2 E) -1

19) If $Y = 7 + \ln(x - 4)$, then $x = ??$

A) e^{Y-3} B) $e^Y - 3$ C) $e^{Y-7} + 4$ D) $\frac{Y-7}{ln} + 4$ E) $-7e^Y + 4$

20) What is the horizontal asymptote of $y = 8 + 3e^{4x}$?

A) $y = 11$ B) $y = 10$ C) $y = 8$ D) $y = 3$ E) $y = 5$

Long Answer.

1) **Find the solution for the equation:** $\log_{81} \sqrt{2x - 1} = \frac{1}{4}$

2) **Find a rational function that satisfies the following:**
   a) **The vertical asymptote is at x = – 12**
   b) **The horizontal asymptote is at y = – 5**
   c) **The x-intercept is at (– 8 , 0)**

3) **If** $Y = 12 + 4^{3x+11}$ **, then solve for the variable x.**

4) **The square of the variable Y varies inversely as the square root of X and directly as the cube of T. If Y = 4 when T = 2 and X = 9 , then what is the value of Y when T = 3 and X = 324?**

5) **Find the complete solution set of** $8^{3x-7} = \frac{1}{4^{12-4x}}$

6) **Find the equation of the parabola with a vertex of (- 7 , 5) and It also passes through the point (– 3 , 53)**