

MAT 170 Test 2 Review Answers

There is a reasonable assumption that most of these answers are not incorrect.

A. Quadratic Functions

1. $f(x) = 3(x-2)^2 - 11$ 2. $f(x) = -2(x+4)^2 - 8$ 3. $f(x) = -3(x-2)^2 + 12$

B. Applications of Quadratic Functions

1. 3 seconds, 485 ft. 2. 10 planes, \$1,700,000

C. Zeros of a Polynomial

1. $0, \frac{7}{2} \pm \frac{1}{2}\sqrt{5}$ 2. $5, -8, \frac{3}{2}$ 3. $1, -1, 3$

D. Zeros and Multiplicities

1. zero at $\frac{-5}{2}$ mult. 1 and zero at 2 mult. 2 2. zero at -2 with mult. 1 and zero at 1 with mult. 2
3. zeros at $-4, \frac{5}{3}, -5$ with mult. of 1 for each.

E. End Behavior of Polynomials

1. rises left, falls right 2. falls left, falls right 3. falls left, rises right

F. Long or Synthetic Division

1. Q: $2x^3 - 2x^2 - 4x + 4$ R: -3 2. Q: $2x - 3$ R: -2 3. Q: $2x^2 - x - 1$ R: 0

G. Vertical Asymptotes

1. $x = \pm 1$ 2. $x = -\frac{1}{3}$ 3. $x = 2$

H. Applications of Rational Functions

- 5 hundred
- 15 is the H.A., the average cost when producing a great number of games is \$15.
- 0.16 ppm is the concentration after a long time.

I. Rewrite in the equivalent logarithmic form

1. $\log_a(65) = x + 1$ 2. $\ln(5) = 3x$

J. Rewrite in the equivalent exponential form

1. $4x = 6^{10}$ 2. $B = e^A$

K. Compound interest

1. a) \$31,050.37 b) \$31,078.69 2. a) \$13,745.79 b) \$14,861.26

L. Properties of Logarithms

1. $5 \log(x) + 7 \log(y) - 3 \log(z)$ 2. $\frac{3}{2} \ln(x-1) + 2 \ln(y+3) - 4 \ln(z)$

3. a) $\ln\left(\frac{x^2 w^9}{y^5}\right)$ b) $\ln\left(\frac{x+3}{x}\right)$ 4. a) $\log\left(\frac{A^3 C^5}{B^4 D^6}\right)$ b) $\log\left(\frac{8x-8}{x}\right)$

M. Exponential Equations

5. a) -7 b) $\frac{7 + \ln(1/2)}{3} = \frac{7 - \ln(2)}{3} \approx 2.102$

6. a) $\ln 5 \approx 1.609$ b) $\frac{\ln(3)}{\ln(7)} = \log_7(3) \approx 0.56458$ c) $\ln\left(\frac{5}{2}\right) \approx 0.916$

N. Domain of Logarithms function:

1. a) $(-\infty, 3)$ b) $(-4, \infty)$

O. Logarithms Equations

2. a) $\left(\frac{19}{2}, 0\right)$ b) $(-1, 0)$ 2. a) $\frac{36}{7}$ b) $\frac{1}{2}$

P. More with polynomials and zeros

1. 0, multiplicity 4; -3, multiplicity 2; 7, multiplicity 8

2. $p(x) = (x^2 + 9)(x + 4)^2$ 3. $p(x) = (x - 5)(x^2 - 4x + 13)$

Q. More with rational functions

1. $r(x) = \frac{9(x-2)(x-7)}{(x-4)(x+5)}$