Math 112 Final Review

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Math 112

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Question 2

Solve the equation.

$$\frac{2}{x-5}+\frac{3}{x}=\frac{5}{x^2-5x}$$

Question 1

Solve the equation.

$$2(x+3)-5=3x+10$$

Question 3

Determine the values of x and y that solve the following system of equations.

$$3x + 6y = 22$$
$$-x + 2y = 10$$

Question 4

A couple invests \$4,000 into an apiary. On average each pint of honey the apiary produces costs \$2.76 to produces and sells for \$10.20 per pint. How many pints of honey does the couple need to sell in order to break even?

Question 5

A shop owner wants to mix high quality tea leaves that cost \$4.95 per pound with lower quality tea leaves that cost \$2.55 per pound to obtain 30 pounds of tea blend that costs \$3.10 per pound. How much of each type of tea should he add to his blend?

Question 6

Calculate the discriminant and state how many solutions the following quadratic equation has.

$$3x^2 - 5x + 1$$

Question 7

Solve for x.

$$(x-1)(x+10)=16$$

Question 8

Consider the quadratic function $f(x) = 3x^2 - 13 - 10$. What is the vertex of $f(x)$?

Question 9

A toy rocket is launched vertically in the air from a 7-foot launching platform with an initial velocity of 40 meters per second. If the equation modeling the height of the rocket is given by $h(t) = -4.9t^2 + v_0 t + h_0$ where v_0 is the initial velocity, and h_0 is the initial height, what is the maximum height reached by the rocket?

Question 10

Farmer Ed has $8,000$ meters of fencing, and wants to enclose a rectangular field, that borders a river on one side. If Farmer Ed, doesn't enclose the side of the field that borders the river, what are the dimensions of the field that maximizes the area?

Question 11

Find the domain of the equation $f(x) = \sqrt{2 - 5x}$

Question 12

Determine which of the following represent y as a function of x. Explain why the equation is or is not a function:

- $x^2 + y^2 - 4 = 0$
- $x^2 + y^3 = -27$
- $xy - y^4 + 4 = 8$

Question 13

Write an equation that has a domain of all real numbers except $x = -3$ and $x = 5$.

Question 14

Determine an equation for the polynomial that has zeros at $x = 0, -1, 1, \sqrt{3}, -\sqrt{3}$ and passes through the point $(4, 10)$.

Question 15

Consider the polynomial function $f(x) = 3(x-5)^2(x^2+2)^3(x+3)^4$.
What is the end behavior of the graph?

Question 16

Consider the rational function:

$$f(x) = \frac{x^2 - 4}{(x^2 - x - 6)}$$

What is the domain of $f(x)$?

Question 17

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. What are the removable discontinuities of $f(x)$?

Question 18

Consider the rational function:

$$f(x) = \frac{x^2 - 4}{(x^2 - x - 6)}$$

What is the slant/horizontal asymptote of $f(x)$?

Question 19

Consider the rational function:

$$f(x) = \frac{x-4}{(x^2+x-6)}$$

. What are the intercepts of $f(x)$?

Question 20

Find a formula for the parabola whose vertex is at $(-2, -1)$ and passes through the point $(0, 13)$.

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Question 21

Consider the following exponential function:

$$f(x) = 3 \cdot \left(\frac{5}{3}\right)^{-2} + 3$$

. List the transformations of the base graph of $f(x)$.

Question 22

Consider the following exponential function:

$$f(x) = 3 \cdot \left(\frac{5}{3}\right)^{-x} + 3$$

.What is the asymptote of $f(x)$?

Question 23

Solve for x:

$$\frac{e^{x+5}}{x^{3x}} = e^{x-1}$$

Question 24

Consider the equation:

$$f(x) = \log_3(x + 11)$$

(1) What is the domain of $f(x)$?

Question 25

Suppose 128 ounces of a radioactive substance exponentially decays to 28 ounces in 6 hours. What is the half-life of the substance?