Math 115E Final Review

Jeopardy Planner

Activity 1 through Activity 9

- Types of numbers, integers, rationals, etc
- Interval Notation, Line vs $[,)$ vs $\leq, \geq$
- Intercepts from a gaph and their (x, y) points, function table, fill in blanks
- Domain and Range from a graph, building their own
- Black out bingo, simple expressions to see who knows what from algebra
- Algebric Rules, simple comps $f(x), f(a), f(x^2 + 1)$, Foiling and pluggin in
- Algebraic Rules, harder comps $f(g(x)), f(x)g(x)$, etc
- Evaluating comps from table, graph, and function,
- ARC on $[a, b]$, from function or graph
- Algebra Review of simple arthimatic

Activity 10 through Activity 17

- Star graph, slope from 2 points
- Star graph (blank), equation from 2 points, find value
- Point slope form, slope intercept form, inequalities
- Finding two numbers puzzle $(a = 1, a \neq 1)$
- Standard form, vertex form, xy inters, vertex, min/max, factoring (a=1)
- Factoring when $a = 1$ vs $a \neq 1$
- Copied, quadratic formula
- Wrap up, adding domain range, rectangle area puzzle

Activity 18 through Activity 21

- Transformation Rules, from function and graph, reflections too
- B4 Quiz Review, Graphing Quadratics, xy inters, vertex, sketch
- Polynomials, identifying them, degree, leading coeff, end behavior
- Multiplicities, xy-intercepts, bounce vs through from a graph, smallest degree

LINK: `https://jeopardylabs.com/edit/final-review-jeopardy-484`
PASSWORD: Math115

Algebraic Expressions

\$100 : Simplify $-2 \times -3 \times -4 \times -5 \longrightarrow 120$

\$200 : Simplify $2 \cdot 7 + 3(2 - 12) + 6 \cdot 2 \longrightarrow -4$

\$300 : Simplify $\left(\frac{1}{2} + 1\right)^2$

\$400 : Simplify $x^2 \cdot x^3 \cdot 3$

\$500 : Simplify $4^3 \div 4^2$

Linear Lines

\$100 : What is the form of a linear function? $\longrightarrow f(x) = mx + b$

\$200 : What is the slope of the function $f(x) = 5x - 3 \longrightarrow m = 5$

\$300 : Solve the linear expression: $12x + 36 = -120 \longrightarrow x = -13$

\$400 : Given $f(x) = 4x - 10$, what is the average rate of change on $[-2, 4] \longrightarrow 4$

\$500 : Solve the linear expression: $1 + 2(x - 5) = x + 13 \longrightarrow x = 22$

Rates of Change

\$100 : Find the slope between the points $(1, 4)$ and $(5, 20) \rightarrow m = 4$

\$200 : Find the equation between the points $(3, -5)$ and $(1, -1) \rightarrow y = -2x + 1$

\$300 : What y value gives us a slope of 3 from $(1, 2)$ and $(2, y) \rightarrow y = 5$

\$400 : What is the value of the slope for the line $y = 10.75 \longrightarrow m = 0$

\$500 : What is the slope of the line $x = -2.5 \longrightarrow$ Undefinied since vertical line

Quadratics

\$100 : Factor $x^2 + 2x + 1 \rightarrow (x + 1)(x + 1)$

\$200 : Factor $2x^2 + 5x + 3 \rightarrow (x + 1)(2x + 3)$

\$300 : Does $x^2 + 16x + 48 = (x + 12)(x + 4)? \longrightarrow$ YES

\$400 : Can $x^2 - 9x - 24$ be factored from the methods we learned? NO

\$500 : Find the solutions to $(x-2)(x+4) = -5$ with any method $\longrightarrow x = 1$ and $x = -3$

Properties

\$100 : What is the vertex of $-3x^2 + 2x + 6 \rightarrow (1/3, 19/3)$

\$200 : TRUE OR FALSE: The vertex alone tells us if that point is a max or min for a quadratic function. FALSE, need a

\$300 : What is the range for $x^2 + 1 \rightarrow (1, \infty)$

\$400 : What are the x-intercepts of $x^2 - 2x - 1 \rightarrow (1 \pm \sqrt{2}, 0)$

\$500 : How many real x-intercepts does $y = 2x^2 - 4x + 3$ have? $\rightarrow$ None

Function Stuffs

\$100 : Given $f(x) = 2x^2, g(x) = x - 3$, Find $f(x)g(x) \longrightarrow 2x^3 - 6x^2$

\$200 : Given $f(x) = 2x^2, g(x) = x - 3$, Find $f(g(x)) \longrightarrow 2x^2 - 12x + 18$

\$300 : Given $f(x) = 4x^2 - 2$, what is the average rate of change on $[0, 2] \longrightarrow 8$

\$400 : Given $f(x) = -x^3 + 2x$ What is the average rate of change on $[-2, 3] \longrightarrow -5$

\$500 : Given $f(x) = 2x^2$. What will the function be with a transformation right 2 units and down 3? $\longrightarrow g(x) = 2(x - 2)^2 - 3$

Polynomials

\$100 : TRUE OR FALSE: $f(x) = -x^2 + x^{-1}$ is a polynomial

\$200 : What is the leading coeff and degree of $g(x) = -2x^3 + 9x^2 - 3 \longrightarrow$coeff: -2, degree: 3

\$300 : What is the end behavior for $f(x) = -x^2 + 2$?
$\longrightarrow x \rightarrow \infty, f(x)\ to - \infty$ and $-x \rightarrow \infty, f(x)\ to - \infty$

\$400 : What are the multiplicities of each solution for $f(x) = (x + 1)^2(x + 2)$
$\longrightarrow x = -1(\text{mult } 2), x = -2(\text{mult } 1)$

\$500 : What are the multiplicities of each solution for $f(x) = x^2(x + 1)^2(x + 2)^3(x - 4)$
$\longrightarrow x = 0(\text{mult } 2), x = -1(\text{mult } 2), x = -2(\text{mult } 3), x = 4(\text{mult } 1)$