Algebra II | PRACTICE Exam 7 | Name:
Dr. Paul L. Bailey | Tuesday, January 18, 2022

The exam will contain ten problems worth ten points each. To study, *make sure you can do all of the problems on the previous exams and quizzes*, and in this practice exam.

Problem 1. Write the slope-intercept form ($y = mx + b$) of the equation of the line which passes through the points $(-8, 13)$ and $(20, -1)$.

Problem 2. Solve the equation $x^3 - 2x^2 + 3x - 6 = 0$. Correctly write the solution set.

Problem 3. Let $f(x) = \dfrac{x^2 - 9}{x - 6}$. Solve the equation $f(x) = 1$. Correctly write the solution set.

Problem 4. Let $g(x) = x^4 - 3x^3 - 23x^2 - 37x + 8$ and $f(x) = x - 7$. Find the quotient and remainder when g is divided by f. (Use synthetic division.)

Problem 5. Let $f(x) = \dfrac{7x^2 + 12x - 31}{x^2 - 8x + 15}$. Find the domain and range of f.

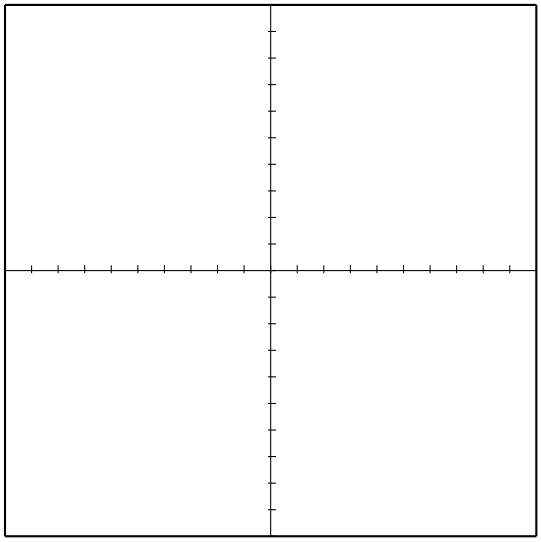
Problem 6. Let $f(x) = \sqrt{3x - 8} + 21$. Find the domain and range of f.

Problem 7. Solve the inequality $|3x - 8| < 21$. Write the solution using correct interval notation.

Problem 8. Solve the inequality $x^3 - 2x^2 + 3x - 6 \geq 0$. Write the solution using correct interval notation.

Problem 9. Of the sets $\mathbb{N}$, $\mathbb{Z}$, $\mathbb{Q}$, $\mathbb{R}$, and $\mathbb{C}$, state the smallest set which contains all solutions to the given equation. For each set, invent an equation whose solutions lie in that set and no smaller set.

Problem 10. Consider the rational function $f(x) = \dfrac{2x - 8}{x + 4}$. Find its degree, zeros, and poles. Find its intercepts and asymptotes. Graph the function and label these features.



Rational Function: $f(x) = \dfrac{2x - 8}{x + 4}$

Degree:

Zeros:

Poles:

y-intercept:

x-intercepts:

Vertical Asymptotes:

Polynomial Asymptote:

Problem 11. Let $A = [2, 8]$, $B = (5, 11)$, and $C = \{1, 3, 5\}$. Write the following sets, using correct set notation.

(a) $A \cup B$

(b) $A \cap B$

(c) $A \setminus B$

(d) $B \setminus A$

(e) $A \setminus C$