

Write answers in simplified exact form: π not 3.14; $3\sqrt{2}$ not $\sqrt{18}$. School: _____

_____ 1. Simplify $(\frac{5}{2}-i)^2$ by writing in the form $a+bi$.

_____ 2. Simplify $\frac{5x^{-4}y^6}{(-2x^3y^{-4})^{-2}}$. Answer with positive exponents only.

_____ 3. Solve $\frac{1}{3}|3x-7|<1$.

_____ 4. Find the remainder when $\frac{1}{2}x^{20}-\frac{1}{3}x^{11}-\frac{5}{6}x^7-8$ is divided by $x+1$.

_____ 5. Tickets for a play cost \$5.00 for students and \$7.00 for adults. If 350 tickets were sold and box office proceeds totaled \$2016, how many adult tickets were sold?

_____ 6. The number of bacteria, N , in a certain refrigerated food is given by $N = 20T^2 - 20T + 120$ where T is the temperature of the food in Celsius. At what temperature will the number of bacteria be minimal?

_____ 7. Write the domain of the function $f(x) = \frac{\sqrt{x}}{x^2-81}$.

_____ 8. Write of the coefficient of the x^4 term in the expansion of $(2x-1)^7$.

_____ 9. Perform the division and simplify: $\frac{x^2-9y^2}{2x^2+5xy-3y^2} \div \frac{x^3-3x^2y-9xy^2+27y^3}{10x-5y}$

_____ 10. Write the solution of the inequality $\frac{x+11}{(x-12)^2} \geq 0$.

_____ 11. Find all real or complex roots of the equation $x^3+x^2-3x+1=0$.

_____ 12. Solve $2x-7x^{\frac{1}{2}}+3=0$