

Algebra II Test 8**1.** (10 points)

The pressure P of a gas *varies inversely* with the volume V of its container AND *directly* with the temperature T .

A certain gas has a pressure of 1.6 atmospheres with a volume of 14 liters and a temperature of 280 kelvins.

If the gas is cooled to a temperature of 250 kelvins and the container is expanded to 16 liters, what will be the new pressure? Be sure to find the value of 'k' first. Show all your work.

2. (10 points)

Identify the zeros, of the function $f(x) = \frac{4x^2 - 36}{x^2 - 4}$.

Zeros: _____

3. (10 points)

Simplify the expression $\sqrt[3]{8z^{12}}$

4. (10 points)

Frets are small metal bars positioned across the neck of a guitar so that the guitar can produce notes of a specific scale. To find the distance a fret should be placed from the bridge, multiply the

string length by $2^{\frac{-n}{12}}$ where n is the number of notes higher than the string's root note.

Determine where to place a fret to produce an A note on a C string (5 notes higher) that is 70 cm long. Round your answer to the nearest hundredth and show your work.

5. (10 points)

The volume V of a cylinder **varies jointly** with the height h and the radius squared r^2 .

$V = 565.20 \text{ cm}^3$ when $h = 5 \text{ cm}$ and $r^2 = 36 \text{ cm}^2$.

Find V when $h = 3 \text{ cm}$ and $r^2 = 9 \text{ cm}^2$. Round your answer to the nearest hundredth.

6. (10 points)

Multiply $\frac{8x^4y^2}{3z^3} \cdot \frac{9xy^2z^6}{4y^4}$.

7. (10 points)

Divide $\frac{2x^6}{5x^5y} \div \frac{4}{5y^4}$.

Name: _____

ID: A

8. (10 points)

Solve $\frac{x^2 - 2x - 8}{x - 4} = 6$.

(Be sure to show all your work and check your final answer!!!)

9. (10 points)

The area of a rectangle is equal to $x^2 + 15x + 44$ square units. If the length of the rectangle is equal to $x + 11$ units, what expression represents its width? Be sure to show all your work.

(Hint: Area = length x width)

10. (10 points)

Add $\frac{x+5}{x-6} + \frac{-12x-16}{x^2-4x-12}$. Show all your work! (Hint: factor the bottom first and then find the LCD)

11. (10 points)

Zelon Pharmaceuticals maintains a courier plane to transport company executives back and forth between the company headquarters and the main manufacturing plant 250 miles away. Today the pilot flew from headquarters to the plant, picked up the Chief of Operations, and returned to headquarters. On the first leg of the trip, the pilot flew against a headwind averaging 10 miles per hour. On the return leg, the average tailwind was 30 miles per hour.

If the pilot spent a total of 2 hours in the air, what would the average speed of the courier plane be with no wind?

A) Fill in the table below:

	Distance (mi)	Average Speed (mi/h)	Time (h)
Leg 1	250		
Leg 2	250		

B). From part A, create an equation that can be used to solve for the average speed of the plane:

Equation: _____

C). Show your work to solve your equation for the average speed of the plane.