

WELL NAME AND NUMBER Sims Federal #2  
 LOCATION 1980' FNL, 1980' FEL, Section 7, T-22-S, R-38-E, Lea County, New Mex.  
 OPERATOR Solar Oil Company  
 DRILLING CONTRACTOR Johnn Drilling Company

The undersigned hereby certifies that he is an authorized representative of the drilling contractor who drilled the above described well and that he has conducted deviation tests and obtained the following results:

<u>DEGREES @ DEPTH</u>	<u>DEGREES @ DEPTH</u>
<u>406' - 1/4</u>	<u>4183' - 1</u>
<u>838' - 1 1/4</u>	<u>4737' - 2 1/4</u>
<u>1037' - 1 1/4</u>	<u>5234' - 1</u>
<u>1571' - 1 1/2</u>	<u>5921' - 1/2</u>
<u>1821' - 1</u>	<u>6280' - 1/2</u>
<u>2102' - 1/4</u>	<u>6625' - No good</u>
<u>2674' - 3/4</u>	<u>7128' - 3/4</u>
<u>3389' - 1 1/4</u>	<u>7400' - 1 1/4</u>
<u>3890' - 3/4</u>	

Drilling Contractor: Johnn Drilling Company

By: Vernon Blain  
 Vernon Blain

Subscribed and sworn to before me this 14th day of April, 19 69.

Beverly Ann Mullins  
 Notary Public-Beverly Ann Mullins

My Commission Expires:

June, 1969

Midland County, Texas

1. The first part of the problem is to find the value of  $\lambda$  such that the system of equations

$$\begin{cases} x + y + z = 1 \\ x + \lambda y + \lambda^2 z = 0 \end{cases}$$

has a non-trivial solution. This is equivalent to finding the values of  $\lambda$  for which the determinant of the coefficient matrix is zero.

The coefficient matrix is  $\begin{pmatrix} 1 & 1 & 1 \\ 1 & \lambda & \lambda^2 \end{pmatrix}$ . The determinant is  $\begin{vmatrix} 1 & 1 & 1 \\ 1 & \lambda & \lambda^2 \end{vmatrix} = 1(\lambda^2 - \lambda) - 1(\lambda^2 - 1) = \lambda^2 - \lambda - \lambda^2 + 1 = 1 - \lambda$ .

Setting the determinant equal to zero, we get  $1 - \lambda = 0$ , which implies  $\lambda = 1$ .

$$\lambda = 1$$

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2. The second part of the problem is to find the value of  $\lambda$  such that the system of equations

$$\begin{cases} x + y + z = 1 \\ x + \lambda y + \lambda^2 z = 0 \end{cases}$$

has a non-trivial solution. This is equivalent to finding the values of  $\lambda$  for which the determinant of the coefficient matrix is zero.

$$\begin{vmatrix} 1 & 1 & 1 \\ 1 & \lambda & \lambda^2 \end{vmatrix} = 0$$

$$\lambda^2 - \lambda - \lambda^2 + 1 = 0$$

$$1 - \lambda = 0$$

$$\lambda = 1$$