

(SUBMIT IN TRIPLICATE)

U. S. Land Office Las Cruces  
Lease or permit No. 030174 (b)

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

SUNDRY NOTICES AND REPORTS ON WELLS

NOTICE OF INTENTION TO DRILL.....	SUBSEQUENT REPORT OF WATER SHUT-OFF.....	
NOTICE OF INTENTION TO CHANGE PLANS.....	SUBSEQUENT REPORT OF SHOOTING OR ACIDIZING.....	X
NOTICE OF INTENTION TO TEST WATER SHUT-OFF.....	SUBSEQUENT REPORT OF ALTERING CASING.....	
NOTICE OF INTENTION TO RE-DRILL OR REPAIR WELL.....	SUBSEQUENT REPORT OF REDRILLING OR REPAIR.....	
NOTICE OF INTENTION TO SHOOT OR ACIDIZE.....	SUBSEQUENT REPORT OF ABANDONMENT.....	
NOTICE OF INTENTION TO PULL OR ALTER CASING.....	SUPPLEMENTARY WELL HISTORY.....	
NOTICE OF INTENTION TO ABANDON WELL.....		

(INDICATE ABOVE BY CHECK MARK NATURE OF REPORT, NOTICE, OR OTHER DATA)

Midland, Texas, March 16, 19 45

W.H. Rhodes (b)

Well No. 11 is located 1980 ft. from S line and 1980 ft. from W line of sec. 26

NE 1/4 Sec. 26  
(1/4 Sec. and Sec. No.)

26-S  
(Twp.)

37-E  
(Range)

N.M.P.M.  
(Meridian)

Rhodes  
(Field)

Lea  
(County or Subdivision)

New Mexico  
(State or Territory)

The elevation of the derrick floor above sea level is 3000 ft.

DETAILS OF WORK

(State names of and expected depths to objective sands; show sizes, weights, and lengths of proposed casings; indicate mudding jobs, cementing points, and all other important proposed work)

Total depth 3240' - Line, 5-1/2" casing cemented at 3089' with 300 sacks.

Before shooting well was swabbed in and flowed 51.06 barrels of pipe line oil in 8 hours. Well was shot 2-27-45 with 80 qts of liquid nitroglycerine from 3200' to 3240', using a 2-yard gravel tamp. After cleaning out to bottom, well flowed 177 barr ls of pipe line oil in 12 hours, through 3/4" choke.

I understand that this plan of work must receive approval in writing by the Geological Survey before operations may be commenced.

Company The Texas Company

Address Box 1270  
Midland, Texas

By [Signature]  
Title Drig. and Prod. Foreman

# THE UNIVERSITY OF CHICAGO

## DEPARTMENT OF MATHEMATICS

### PROBLEM SET 1

1. Let  $f: \mathbb{R} \rightarrow \mathbb{R}$  be a function satisfying the functional equation

$$f(x+y) = f(x) + f(y) \quad \text{for all } x, y \in \mathbb{R}.$$

Assume further that  $f$  is continuous at the origin. Prove that  $f$  is linear, i.e., there exists a constant  $c \in \mathbb{R}$  such that  $f(x) = cx$  for all  $x \in \mathbb{R}$ .

2. Let  $S$  be a set and let  $\mathcal{P}(S)$  denote the power set of  $S$ . Define a relation  $\sim$  on  $\mathcal{P}(S)$  by

$$A \sim B \iff A \Delta B \text{ is finite,}$$

where  $A \Delta B = (A \setminus B) \cup (B \setminus A)$  is the symmetric difference of  $A$  and  $B$ . Prove that  $\sim$  is an equivalence relation. Furthermore, let  $[A]$  denote the equivalence class of  $A$ . Show that the collection of equivalence classes  $\{[A] : A \in \mathcal{P}(S)\}$  forms a vector space over  $\mathbb{F}_2$  under the operations

$$[A] + [B] = [A \Delta B] \quad \text{and} \quad \alpha[A] = [A] \quad \text{for } \alpha \in \mathbb{F}_2.$$

3. Let  $X$  be a topological space and let  $\mathcal{C}(X, \mathbb{R})$  denote the set of continuous real-valued functions on  $X$ . Suppose that  $X$  is a Tychonoff space (i.e., a completely regular Hausdorff space). Prove that the set of functions  $f \in \mathcal{C}(X, \mathbb{R})$  such that  $f(x) \in \mathbb{Q}$  for all  $x \in X$  is dense in  $\mathcal{C}(X, \mathbb{R})$  with respect to the topology of uniform convergence on compact sets.

4. Let  $G$  be a group and let  $H$  be a subgroup of  $G$ . Define the commutator of two elements  $x, y \in G$  as  $[x, y] = xyx^{-1}y^{-1}$ . Let  $\gamma_n(G)$  denote the  $n$ -th term of the lower central series of  $G$ , defined inductively by  $\gamma_1(G) = G$  and  $\gamma_{n+1}(G) = \langle [x, y] : x, y \in \gamma_n(G) \rangle$ . Prove that if  $G$  is a free group of rank  $r$ , then  $\gamma_n(G)$  is a free group of rank  $\frac{r^2-1}{2}n$ .