

Applied Hydrogeology | (4th Edition)

Chapter 3, Problem 20P

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Problem

Answers to odd-numbered problems appear at the end of the book.
Repeat Problem 19 using Excel functions and graphing.

Step-by-step solution

Step 1 of 8

Show the calculation of natural logarithm of hydraulic conductivity (LN(K)) using spreadsheet as in Figure (1).

	A	B	C
	Sl.No	Hydraulic conductivity, K	$\ln(K)$
1			
2	1	0.00043	=LN(B2)
3	2	0.0061	=LN(B3)
4	3	0.000025	=LN(B4)
5	4	0.00012	=LN(B5)
6	5	0.000001	=LN(B6)
7	6	0.0071	=LN(B7)
8	7	0.0000091	=LN(B8)
9	8	0.0022	=LN(B9)
10	9	0.000042	=LN(B10)
11	10	0.00087	=LN(B11)
12	11	0.000035	=LN(B12)
13		=SUM(B2:B12)	=SUM(C2:C12)

Comment

Step 2 of 8

Show the results of calculation of LN(K) and summation of hydraulic conductivity and LN(K) using spread sheet as shown in Figure (2).

	A	B	C
	Sl.No	Hydraulic conductivity, K	$\ln(K)$
1			
2	1	0.00043	-7.751725
3	2	0.0061	-5.099467
4	3	0.000025	-10.59663
5	4	0.00012	-9.028019
6	5	0.000001	-13.81551
7	6	0.0071	-4.94766
8	7	0.0000091	-11.60724
9	8	0.0022	-6.119298
10	9	0.000042	-10.07784
11	10	0.00087	-7.047017
12	11	0.000035	-10.26016
13		0.0169321	-96.35057

Comment

Step 3 of 8

Show the calculation of arithmetic and geometric mean of data set using spread sheet as shown in Figure (3).

15			
16	(A)		
17	Arithmetic mean	=(B13/A12)	m/s
18			
19	(B)		
20	Geometric mean	=EXP(C13/A12)	m/s
21			

Comment

Step 4 of 8

To plot the histogram, select Data option in toolbar and select data analysis in the dropdown. In the data analysis pop up window, select histogram. Select data for histogram (Input Range and Bin Range).

Select data analysis option to draw histogram using spread sheet as shown in Figure (4).

	A	B	C	D	E	F	G
	Sl.No	Hydraulic conductivity, K	$\ln(K)$				
1							
2	1	0.00043	=LN(B2)				
3	2	0.0061	=LN(B3)				
4	3	0.000025	=LN(B4)				
5	4	0.00012	=LN(B5)				
6	5	0.000001	=LN(B6)				
7	6	0.0071	=LN(B7)				
8	7	0.0000091	=LN(B8)				
9	8	0.0022	=LN(B9)				
10	9	0.000042	=LN(B10)				
11	10	0.00087	=LN(B11)				
12	11	0.000035	=LN(B12)				
13		=SUM(B2:B12)	=SUM(C2:C12)				
14							
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Comment

Step 5 of 8

Group the hydraulic conductivity in the range (Bin Range) of 0.000001, 0.000005, 0.00001, 0.00005, 0.0001, 0.0005, 0.001, and more than 0.001.

Select data required to draw the histogram for hydraulic conductivity and frequency using spread sheet as shown in Figure (5).

	A	B	C	D	E	F	G	H	I	J
	Sl.No	Hydraulic conductivity, K	$\ln(K)$							
1										
2	1	0.00043	-7.751725							
3	2	0.0061	-5.099467							
4	3	0.000025	-10.59663							
5	4	0.00012	-9.028019							
6	5	0.000001	-13.81551							
7	6	0.0071	-4.94766							
8	7	0.0000091	-11.60724							
9	8	0.0022	-6.119298							
10	9	0.000042	-10.07784							
11	10	0.00087	-7.047017							
12	11	0.000035	-10.26016							
13		0.0169321	-96.35057							
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Comment

Step 6 of 8

Show the histogram formed using spread sheet as in Figure (6).

	A	B	C	D	E	F	G	H	I	J
	Sl.No	Hydraulic conductivity, K	$\ln(K)$							
1										
2	1	0.00043	-7.751725							
3	2	0.0061	-5.099467							
4	3	0.000025	-10.59663							
5	4	0.00012	-9.028019							
6	5	0.000001	-13.81551							
7	6	0.0071	-4.94766							
8	7	0.0000091	-11.60724							
9	8	0.0022	-6.119298							
10	9	0.000042	-10.07784							
11	10	0.00087	-7.047017							
12	11	0.000035	-10.26016							
13		0.0169321	-96.35057							
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Comment

Step 7 of 8

Similarly select the data required to draw histogram for LN(K) and its frequency using spread sheet as shown in Figure (7).

	A	B	C	D	E	F	G	H	I	J
	Sl.No	Hydraulic conductivity, K	$\ln(K)$							
1										
2	1	0.00043	-7.751725							
3	2	0.0061	-5.099467							
4	3	0.000025	-10.59663							
5	4	0.00012	-9.028019							
6	5	0.000001	-13.81551							
7	6	0.0071	-4.94766							
8	7	0.0000091	-11.60724							
9	8	0.0022	-6.119298							
10	9	0.000042	-10.07784							
11	10	0.00087	-7.047017							
12	11	0.000035	-10.26016							
13		0.0169321	-96.35057							
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Comment

Step 8 of 8

Show the histogram formed using spread sheet as in Figure (8).

	A	B	C	D	E	F	G	H	I	J
	Sl.No	Hydraulic conductivity, K	$\ln(K)$							
1										
2	1	0.00043	-7.751725							
3	2	0.0061	-5.099467							
4	3	0.000025	-10.59663							
5	4	0.00012	-9.028019							
6	5	0.000001	-13.81551							
7	6	0.0071	-4.94766							
8	7	0.0000091	-11.60724							
9	8	0.0022	-6.119298							
10	9	0.000042	-10.07784							
11	10	0.00087	-7.047017							
12	11	0.000035	-10.26016							
13		0.0169321	-96.35057							
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Comment

Was this solution helpful?

1

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Recommended solutions for you in Chapter 3

Answers to odd-numbered problems appear at the end of the book.A confined aquifer has a specific storage of 1.022 x 10–6 ft–1 and a thickness of 23 ft. How much water would it yield if the water declined an average of 1.75 ft over a circular...

[View this solution](#)

Answers to odd-numbered problems appear at the end of the book.The hydraulic conductivity of a silty sand was measured in a laboratory permeameter and found to be 3.75 x10–5 cm/s at 25°C What is the intrinsic permeability in cm2? Refer to...

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