Physics 216: Homework 2

Due on February 5, 2019 at 11:59pm

Pages: 3

Professor Ostrovskya Section 509

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Problem 1

	A	B	C	D	E	F	G	H	I
1	**Problem 1**								
2	Average Speed								
3									
4	Clock Time (hh:mm:ss)	Clock Time (day)	Clock Time (hr)	Odometer Reading (mi)		Time Interval (hr)	Distance (mi)		Average speed (MPH)
5	0:00:00	0	0	100.0					
6	1:00:00	0.041666667	1	158.7		1.00	58.7		58.7
7	2:04:23	0.086377315	2.073055556	218.4		1.07	59.7		55.6
8	2:56:24	0.1225	2.94	267.5		0.87	49.1		56.6
9	3:45:23	0.156516204	3.756388889	315.8		0.82	48.3		59.2
10	4:12:00	0.175	4.2	340.3		0.44	24.5		55.2
11	5:34:03	0.231979167	5.5675	422.4		1.37	82.1		60.0

Problem 2

	A	B	C	D	E
1	**Problem 2**				
2	Quality control		pmin	1.25	
3			qmax	0.50	
4					
5	P	Q	P test	Q test	Two tests
6	1.70	0.65	1	0	0
7	1.36	0.50	1	1	1
8	1.44	0.40	1	1	1
9	1.57	0.45	1	1	1
10	1.90	0.82	1	0	0
11	1.52	0.32	1	1	1
12	1.23	0.75	0	0	0
13	1.65	0.50	1	1	1
14	1.29	0.36	1	1	1
15	1.15	0.45	0	1	0
16		Percentage passing	80.0%	70.0%	60.0%
17					

The following are listed equations within the specified cells.

- **D11** =IF(B11<=$D$3, 1, 0)

- **E11** =IF(AND(A11>=$D$2,B11<=$D$3), 1, 0)

- **D16** =IF(B6<=$D$3, 1, 0)

If q_{max} is changed to 0.75 and p_{min} is changed to 1.50, the passing rate for both tests and the q test decrease while the p test increases, as observed below.

	A	B	C	D	E
1	**Problem 2**				
2	Quality control		pmin	1.5	
3			qmax	0.75	
4					
5	P	Q	P test	Q test	Two tests
6	1.70	0.65	1	1	1
7	1.36	0.50	0	1	0
8	1.44	0.40	0	1	0
9	1.57	0.45	1	1	1
10	1.90	0.82	1	0	0
11	1.52	0.32	1	1	1
12	1.23	0.75	0	1	0
13	1.65	0.50	1	1	1
14	1.29	0.36	0	1	0
15	1.15	0.45	0	1	0
16		Percentage passing	50.0%	90.0%	40.0%
17					

Problem 3

	A	B	C	D	E
1	**Problem 3**	Gas-sparge system			
2	P0 (W)	794		(d/DT)^4.38	0.004768
3	d (m)	0.36		(d²N/v)^0.115	4.415957
4	DT (m)	1.22		(dN²/g)^1.96(d/DT)	0.486494
5	N (1/s)	2.8		(Q/Nd³)	0.031844
6	v (m^2/s)	8.93E-07		RHS	-0.06263
7	g (m/s^2)	9.81		Computed PG	687.3703
8	Q (m^3/s)	0.00416			
9	**Computed PG (W)**	687.3703			
10					

- **E2** =(B3/B4)^4.38

- **E3** =(B3^2*B5/B6)^0.115

- **E4** =(B3*(B5^2)/B7)^(1.96*(B3/B4))

- **E5** =B8/(B5*B3^3)

- **E7** =E2*E3*E4*E5*-192

- **B9** =B2 * 10^(-192 * (B3/B4)^4.38 * ((B3^2 * B5) / B6)^(0.115) * ((B3 * B5^2) / B7)^(1.96 * (B3 / B4)) * (B8 / (B5 * B3^3)))