

Berechnung der Zentrifugalkraft

Dokumentnummer: DX1049

Fachgebiet: Physik

Kreisbewegung

Listenverarbeitung

Problembeschreibung

Masse in kg	Radius in m	Geschwindigkeit in km/h	Geschwindigkeit in m/s	Kraft in N
1000	50	45	12,50	3.125,00
2000	60	50	13,89	6.430,04
3000	40	35	9,72	7.089,12
4000	45	45	12,50	13.888,89
5000	55	25	6,94	4.384,12

Problemlösung

EINGABE

(%i16) m:[1000,2000,3000,4000,5000];r:[50,60,40,45,55];V:[45,50,35,45,25];

(%o16) [1000 , 2000 , 3000 , 4000 , 5000]

(%o17) [50 , 60 , 40 , 45 , 55]

(%o18) [45 , 50 , 35 , 45 , 25]

VERARBEITUNG

(%i19) v:V/3.6;

(%o19) [12.5 , 13.888888888888889 , 9.722222222222223 , 12.5 , 6.944444444444445]

(%i20) f:m*v**2/r;

(%o20) [3125.0 , 6430.041152263375 , 7089.120370370372 , 13888.888888888889 ,
4384.1189674523]

Zentrifugalkraft mit Listenverarbeitung

```
(%i21) f:map(floor,f*1000+0.5)/1000.0;
```

```
(%o21) [ 3125.0 , 6430.041 , 7089.12 , 13888.889 , 4384.119 ]
```

```
(%i22) v:map(floor,v*1000+0.5)/1000.0;
```

```
(%o22) [ 12.5 , 13.889 , 9.722 , 12.5 , 6.944 ]
```

AUSGABE

```
(%i23) ergebnis: matrix(  
["m in kg","r in m","v in km/h","v in m/s","F in N"],  
[transpose(m),transpose(r),transpose(V),transpose(v),transpose(f)]  
);
```

```
(%o23) [ m in kg  r in m  v in km/h  v in m/s  F in N ]  
[ [ 1000 ] [ 50 ] [ 45 ] [ 12.5 ] [ 3125.0 ]  
[ 2000 ] [ 60 ] [ 50 ] [ 13.889 ] [ 6430.041 ]  
[ 3000 ] [ 40 ] [ 35 ] [ 9.722 ] [ 7089.12 ]  
[ 4000 ] [ 45 ] [ 45 ] [ 12.5 ] [ 13888.889 ]  
[ 5000 ] [ 55 ] [ 25 ] [ 6.944 ] [ 4384.119 ] ]
```

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