

HP-35s Calculator Program –

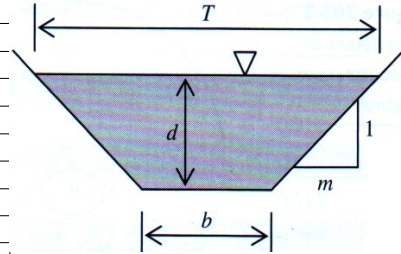
HYDRAULIC RADIUS & FLOW

Author: J. E. Charalambides

Date: December 14/2014

© 2014 J. E. Charalambides

Line	Instruction	Process	User Instruction
R001	LBL R	Establishing the library (R for Radius)	
R002	CLSTK	Clearing the stack	
R003	CLVARS	Clearing the variables	
R004	HYDRO RADIUS	Title	
R005	PSE	Short Pause	
R006	CIRCLE		
R007	PSE	Short Pause	
R008	INPUT H	Input 1 (or value ≠0 anyway) for Yes, 0 for No to Circle	
R009	x=0?		
R010	GTO R076	Takes you to option for straight walls	
R011	DIAMETER		
R012	PSE		
R013	INPUT D	Input the diameter of the circle	
R014	WATER DEPTH		
R015	PSE		
R016	INPUT H	Input the depth of the water	
R017	2		
R018	x		
R019	RCL D		
R020	÷		
R021	+/-		
R022	1		
R023	+		
R024	ACOS		
R025	2		
R026	x		
R027	→RAD		
R028	STO Q		
R029	→DEG		
R030	SIN		
R031	RCL Q		
R032	÷		
R033	+/-		
R034	1		
R035	+		
R036	4		
R037	÷		
R038	RCL D		
R039	x		
R040	STO R		
R041	INPUT R		
R042	x		
R043	-		
R044	+/-		
R045	RCL D		
R046	RCL Q		
R047	RCL D		
R048	x		
R049	2		
R050	÷		
R051	STO P		
R052	RCL Q		
R053	ENTER		
R054	→DEG		
R055	SIN		
R056	-		
R057	8		
R058	÷		
R059	RCL D		
R060	x^2		
R061	x		
R062	STO A		



Nomenclature:

- A = Area of Flow
- B = Base Width of Area of Water (see diag)
- D = Water depth
- H = Variable used for Yes/No 1/0 questions
- M = Slope factor (see diag)
- N = Manning's "n" Coefficient
- P = Wet Perimeter
- Q = Flow
- R = Hydraulic Radius
- S = Slope of Pipe
- T = Width of Water Surface
- V = Volume of Water to be Discharged
- Z = Hydraulic Depth

R063	RCL D		
R064	RCL H		
R065	-		
R066	RCL H		
R067	x		
R068	\sqrt{x}		
R069	2		
R070	x		
R071	STO T		
R072	WIDTH FR SURFACE		
R073	PSE		
R074	VIEW T		
R075	GTO R125		
R076	STRAIGHT		
R077	PSE		+
R078	INPUT H	Input 1 (or value $\neq 0$ anyway) for Yes, 0 for No to	
R079	x=0?	Straight	
R080	GTO R006		
R081	INPUT T	Input the width of the water surface (see diagram)	
R082	INPUT B	Input the base of the water (see diagram)	
R083	INPUT D	Input the depth of the water (see diagram)	
R084	2		
R085	x		
R086	1/x		
R087	RCL T		
R088	RCL B		
R089	-		
R090	x		
R091	STO M		
R092	VIEW M	Viewing slope factor m (see diagram)	
R093	RCL D		
R094	x		
R095	RCL B		
R096	+		
R097	RCL D		
R098	x		
R099	STO A		
R100	CLSTK		
R101	RCL M		
R102	x^2		
R103	1		
R104	+		
R105	\sqrt{x}		
R106	2		
R107	x		
R108	RCL D		
R109	x		
R110	RCL B		
R111	+		
R112	STO P		
R113	CLSTK		
R114	RCL A		
R115	RCL P		
R116	+		
R117	STO R		
R118	RCL A		
R119	RCL T		
R120	+		
R121	STO Z		
R122	HYDRO DEPTH		
R123	PSE		
R124	VIEW Z	Viewing Hydraulic Depth	
R125	AREA OF FLOW		
R126	PSE		
R127	VIEW A	Viewing Area of Flow	
R128	WET PERIMETER		
R129	PSE		
R130	VIEW P	Viewing Wet Perimeter	
R131	HYDRO RADIUS		

R132	PSE		
R133	VIEW R	Viewing the Hydraulic Radius	
R134	CLSTK		
R135	STO H		
R136	CALCULATE FLOW		
R137	PSE		
R138	INPUT H	Input 1 (or value ≠0 anyway) for Yes, 0 for No	
R139	x=0?	to calculate the flow	
R140	GTO R175		
R141	MANNING COEFF		
R142	PSE		
R143	INPUT N		
R144	1/x		
R145	149		
R146	x		
R147	RCL R		
R148	0.666666667		
R149	y^x		
R150	x		
R151	RCLA		
R152	x		
R153	SLOPE (0.XXX)		
R154	PSE		
R155	INPUT S	Input the slope in decimals	
R156	√x		
R157	x		
R158	STO Q		
R159	VIEW Q	Viewing flow	
R160	TIME DISCHARGE		
R161	PSE		
R162	INPUT H	Input 1 (or value ≠0 anyway) for Yes, 0 for No	
R163	x=0?	to calculate the time of discharge	
R164	GTO D175		
R165	VOLUME TO FILL		
R166	PSE		
R167	INPUT V	Input the volume to fill	
R168	RCL Q		
R169	÷		
R170	3600		
R171	÷		
R172	STO T		
R173	VIEW T	Viewing the time to discharge the volume	
R174	CLSTK		
R175	RTN		