

Climbs/Descents per Nautical Mile

Table One: Climb/Descent Angles

Rule of Thumb for angles 2.0 to 7.0 degrees by .5 degrees; 60 knots to 360 knots by 30 knots (ground speed)¹

Climb/ Descent angle	Altitude (in feet) required to be gained/lost: rate per NM	Ground Speed											
		60	90	120	150	180	210	240	270	300	330	360	
2.0	200	200	300	400	500	600	700	800	900	1,000	1,100	1,200	Vertical Speed Feet/Minute required
2.5	250	250	375	500	625	750	875	1,000	1,125	1,250	1,375	1,500	
3.0	300	300	450	600	750	900	1,050	1,200	1,350	1,500	1,650	1,800	
3.5	350	350	525	700	875	1,050	1,225	1,400	1,575	1,750	1,925	2,100	
4.0	400	400	600	800	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,400	
4.5	450	450	675	900	1,125	1,350	1,575	1,800	2,025	2,250	2,475	2,700	
5.0	500	500	750	1,000	1,250	1,500	1,750	2,000	2,250	2,500	2,750	3,000	
5.5	550	550	825	1,100	1,375	1,650	1,925	2,200	2,475	2,750	3,025	3,300	
6.0	600	600	900	1,200	1,500	1,800	2,100	2,400	2,700	3,000	3,300	3,600	
6.5	650	650	975	1,300	1,625	1,950	2,275	2,600	2,925	3,250	3,575	3,900	
7.0	700	700	1,050	1,400	1,750	2,100	2,450	2,800	3,150	3,500	3,850	4,200	

Note 1: the "Rule of Thumb" is 100 feet per minute per degree of slope at 60 knots

Table Two: Climb/Descent Angles

Computed for angles 2.0 to 7.0 degrees by .5 degrees; 60 knots to 360 knots by 30 knots (ground speed)²

Climb/ Descent angle	Altitude (in feet) required to be gained/lost: rate per NM	Ground Speed											
		60	90	120	150	180	210	240	270	300	330	360	
2.0	212	212	318	424	530	637	743	849	955	1,061	1,167	1,273	Vertical Speed Feet/Minute required
2.5	265	265	398	531	663	796	929	1,061	1,194	1,326	1,459	1,592	
3.0	318	318	478	637	796	955	1,115	1,274	1,433	1,592	1,751	1,911	
3.5	372	372	557	743	929	1,115	1,301	1,487	1,672	1,858	2,044	2,230	
4.0	425	425	637	850	1,062	1,275	1,487	1,700	1,912	2,124	2,337	2,549	
4.5	478	478	717	956	1,196	1,435	1,674	1,913	2,152	2,391	2,630	2,869	
5.0	532	532	797	1,063	1,329	1,595	1,861	2,126	2,392	2,658	2,924	3,190	
5.5	585	585	878	1,170	1,463	1,755	2,048	2,340	2,633	2,925	3,218	3,510	
6.0	639	639	958	1,277	1,597	1,916	2,235	2,555	2,874	3,193	3,512	3,832	
6.5	692	692	1,038	1,385	1,731	2,077	2,423	2,769	3,115	3,461	3,808	4,154	
7.0	746	746	1,119	1,492	1,865	2,238	2,611	2,984	3,357	3,730	4,103	4,476	

Note 2: The formula is very simple: convert knots (nautical miles per hour) to nautical mile per minute (i.e., divide by 60), then multiply by feet per minute climb/descent.

Table Three: Feet per nautical mile

Computed for 200 feet to 700 feet by 50 feet; 60 knots to 360 knots by 30 knots (ground speed)

Climb/ Descent angle	Altitude (in feet) required to be gained/lost: rate per NM	Ground Speed											
		60	90	120	150	180	210	240	270	300	330	360	
1.9	200	200	300	400	500	600	700	800	900	1,000	1,100	1,200	Vertical Speed Feet/Minute required
2.4	250	250	375	500	625	750	875	1,000	1,125	1,250	1,375	1,500	
2.8	300	300	450	600	750	900	1,050	1,200	1,350	1,500	1,650	1,800	
3.3	350	350	525	700	875	1,050	1,225	1,400	1,575	1,750	1,925	2,100	
3.8	400	400	600	800	1,000	1,200	1,400	1,600	1,800	2,000	2,200	2,400	
4.2	450	450	675	900	1,125	1,350	1,575	1,800	2,025	2,250	2,475	2,700	
4.7	500	500	750	1,000	1,250	1,500	1,750	2,000	2,250	2,500	2,750	3,000	
5.2	550	550	825	1,100	1,375	1,650	1,925	2,200	2,475	2,750	3,025	3,300	
5.6	600	600	900	1,200	1,500	1,800	2,100	2,400	2,700	3,000	3,300	3,600	
6.1	650	650	975	1,300	1,625	1,950	2,275	2,600	2,925	3,250	3,575	3,900	
6.6	700	700	1,050	1,400	1,750	2,100	2,450	2,800	3,150	3,500	3,850	4,200	

Table Three A / DETAIL: Feet per nautical mile

Computed for 200 feet to 450 feet by 10 feet; 60 knots to 210 knots by 15 knots (ground speed)

Angle	Rate per NM	Ground Speed											
		60	75	90	105	120	135	150	165	180	195	210	
1.9	200	200	250	300	350	400	450	500	550	600	650	700	Vertical Speed Feet/Minute required
2.0	210	210	263	315	368	420	473	525	578	630	683	735	
2.1	220	220	275	330	385	440	495	550	605	660	715	770	
2.2	230	230	288	345	403	460	518	575	633	690	748	805	
2.3	240	240	300	360	420	480	540	600	660	720	780	840	
2.4	250	250	313	375	438	500	563	625	688	750	813	875	
2.5	260	260	325	390	455	520	585	650	715	780	845	910	
2.6	270	270	338	405	473	540	608	675	743	810	878	945	
2.7	280	280	350	420	490	560	630	700	770	840	910	980	
2.8	290	290	363	435	508	580	653	725	798	870	943	1,015	
2.8	300	300	375	450	525	600	675	750	825	900	975	1,050	
2.9	310	310	388	465	543	620	698	775	853	930	1,008	1,085	
3.0	320	320	400	480	560	640	720	800	880	960	1,040	1,120	
3.1	330	330	413	495	578	660	743	825	908	990	1,073	1,155	
3.2	340	340	425	510	595	680	765	850	935	1,020	1,105	1,190	
3.3	350	350	438	525	613	700	788	875	963	1,050	1,138	1,225	
3.4	360	360	450	540	630	720	810	900	990	1,080	1,170	1,260	
3.5	370	370	463	555	648	740	833	925	1,018	1,110	1,203	1,295	
3.6	380	380	475	570	665	760	855	950	1,045	1,140	1,235	1,330	
3.7	390	390	488	585	683	780	878	975	1,073	1,170	1,268	1,365	
3.8	400	400	500	600	700	800	900	1,000	1,100	1,200	1,300	1,400	
3.9	410	410	513	615	718	820	923	1,025	1,128	1,230	1,333	1,435	
4.0	420	420	525	630	735	840	945	1,050	1,155	1,260	1,365	1,470	
4.0	430	430	538	645	753	860	968	1,075	1,183	1,290	1,398	1,505	
4.1	440	440	550	660	770	880	990	1,100	1,210	1,320	1,430	1,540	
4.2	450	450	563	675	788	900	1,013	1,125	1,238	1,350	1,463	1,575	

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