

# DENSITY ALTITUDE



## CALCULATING FOR SAFETY

Name \_\_\_\_\_

Class \_\_\_\_\_

Use the following sample charts from a Pilot's Operating Handbook (POH) to calculate the takeoff and landing ground rolls and associated distances over a 50-ft obstacle for a Cessna 172 in the following scenarios. Answer several questions at the end of the activity related to the relationship between altitude and temperature change and its effect on aircraft performance.

### SCENARIO 1

Outside Air Temperature: 10 °C

Pressure Altitude: 1,000 ft

Takeoff Ground Roll \_\_\_\_\_

Total to Clear 50-ft Obstacle \_\_\_\_\_

Landing Ground Roll \_\_\_\_\_

Total to Clear 50-ft Obstacle \_\_\_\_\_

### SCENARIO 2

Outside Air Temperature: 40 °C

Pressure Altitude: 7,000 ft

Takeoff Ground Roll \_\_\_\_\_

Total to Clear 50-ft Obstacle \_\_\_\_\_

Landing Ground Roll \_\_\_\_\_

Total to Clear 50-ft Obstacle \_\_\_\_\_

### SCENARIO 3

Outside Air Temperature: 0 °C

Pressure Altitude: 6,000 ft

Takeoff Ground Roll \_\_\_\_\_

Total to Clear 50-ft Obstacle \_\_\_\_\_

Landing Ground Roll \_\_\_\_\_

Total to Clear 50-ft Obstacle \_\_\_\_\_



### SHORT FIELD TAKEOFF DISTANCE AT 2550 POUNDS

CONDITIONS:

Flaps 10°  
Full Throttle Prior to Brake Release  
Paved, level, dry runway  
Zero Wind  
Lift Off: 51 KIAS  
Speed at 50 Ft: 56 KIAS

Press Alt In Feet	0°C		10°C		20°C		30°C		40°C	
	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst
S. L.	860	1465	925	1575	995	1690	1070	1810	1150	1945
1000	940	1600	1010	1720	1090	1850	1170	1990	1260	2135
2000	1025	1755	1110	1890	1195	2035	1285	2190	1380	2355
3000	1125	1925	1215	2080	1310	2240	1410	2420	1515	2605
4000	1235	2120	1335	2295	1440	2480	1550	2685	1660	2880
5000	1355	2345	1465	2545	1585	2755	1705	2975	1825	3205
6000	1495	2605	1615	2830	1745	3075	1875	3320	2010	3585
7000	1645	2910	1785	3170	1920	3440	2065	3730	2215	4045
8000	1820	3265	1970	3575	2120	3880	2280	4225	2450	4615

### SHORT FIELD LANDING DISTANCE AT 2550 POUNDS

CONDITIONS:

Flaps 30°  
Power Off  
Maximum Braking  
Paved, level, dry runway  
Zero Wind  
Speed at 50 Ft: 61 KIAS

Press Alt In Feet	0°C		10°C		20°C		30°C		40°C	
	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst	Grnd Roll Ft	Total Ft To Clear 50 Ft Obst
S. L.	545	1290	565	1320	585	1350	605	1380	625	1415
1000	565	1320	585	1350	605	1385	625	1420	650	1450
2000	585	1355	610	1385	630	1420	650	1455	670	1490
3000	610	1385	630	1425	655	1460	675	1495	695	1530
4000	630	1425	655	1460	675	1495	700	1535	725	1570
5000	655	1460	680	1500	705	1535	725	1575	750	1615
6000	680	1500	705	1540	730	1580	755	1620	780	1660
7000	705	1545	730	1585	760	1625	785	1665	810	1705
8000	735	1585	760	1630	790	1670	815	1715	840	1755

