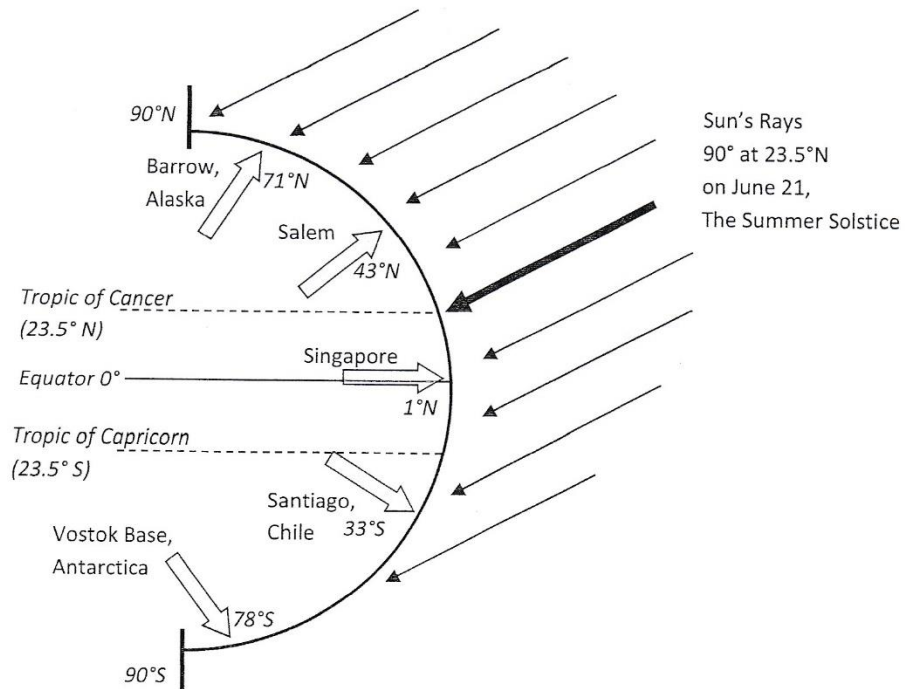


Surface Area of Radiation and Beam Intensity Exercises

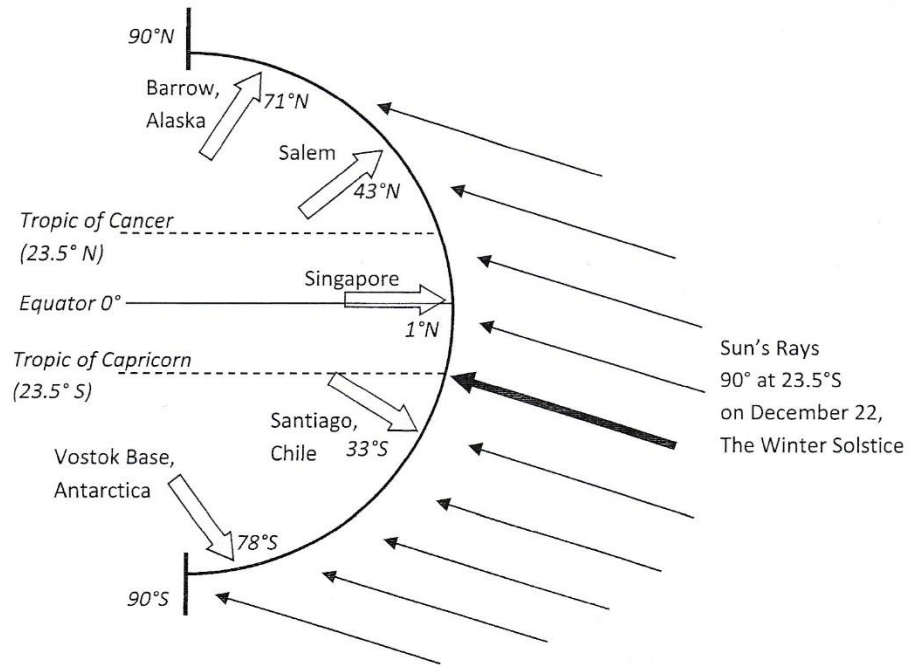
Calculate the Surface Area of Radiation (SAR) and Beam Intensity (BI%) for the following locations on the dates specified.

The Summer Solstice, June 21



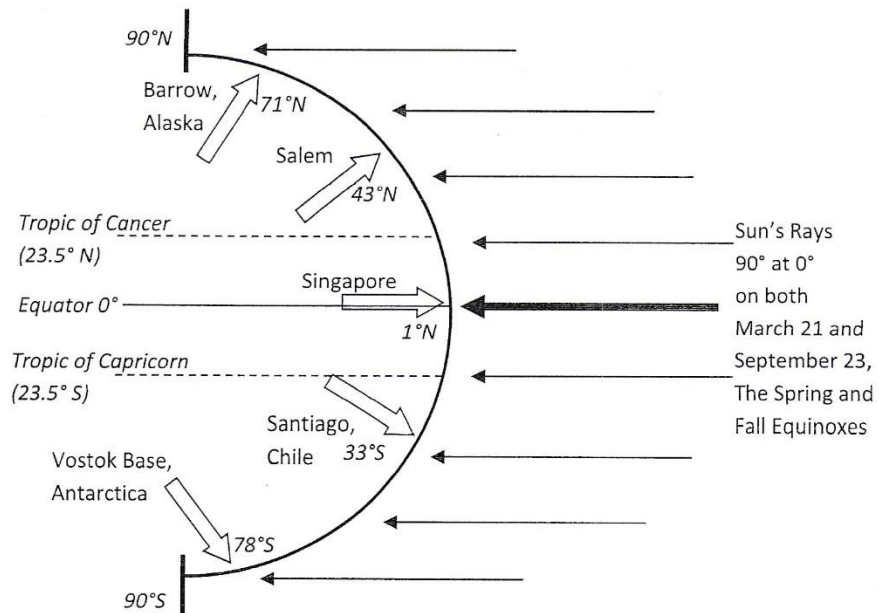
Place	Lat of Place	Lat. Of 90° Sun	Ang. Dist / Zenith Ang.	Sun Ang.	SAR	BI%
Barrow, AK	71° N	23.5° N	47.5	42.5	1.479	67.6%
Salem, MA	43° N	23.5° N	19.5	70.5	1.060	94.3%
Singapore	1° N	23.5° N	22.5	67.5	1.082	92.4%
Santiago, Chile	33° S	23.5° N	56.5	33.5	1.812	55.2%
Vostok Base, Antarctica	78° S	23.5° N	101.5	NO SUN	NO SUN	NO SUN

The Winter Solstice, December 21



Place	Lat of Place	Lat. Of 90° Sun	Ang. Dist / Zenith Ang.	Sun Ang.	SAR	BI%
Barrow, AK	71° N	23.5° S	94.5	NO SUN	NO SUN	NO SUN
Salem, MA	43° N	23.5° S	66.5	23.5	2.506	39.9%
Singapore	1° N	23.5° S	24.5	65.5	1.099	91.0%
Santiago, Chile	33° S	23.5° S	9.5	80.5	1.014	98.6%
Vostok Base, Antarctica	78° S	23.5° S	54.5	35.5	1.721	58.1%

The Spring Equinox (March 21) and the Fall Equinox (September 23)



Place	Lat of Place	Lat. Of 90° Sun	Ang. Dist / Zenith Ang.	Sun Ang.	SAR	BI%
Barrow, AK	71° N	0°	71	19	3,067	32.6%
Salem, MA	43° N	0°	43	47	1.368	73.1%
Singapore	1° N	0°	1	89	1.000	100%
Santiago, Chile	33° S	0°	33	57	1.192	83.9%
Vostok Base, Antarctica	78° S	0°	78	12	4.808	20.8%