

Question 1

1. The [ ] is used to make sure that the compass indicates the correct orientation of geological structures by placing it on the planar surface to be measured.
2. The [ ] is used to ensure that the hinge of the compass (between the base plate and the lid) is oriented along strike.
3. The red side of the magnetic needle must align with the red side of the [ ] when the rotating dial is used to measure the dip direction of a planar feature.
4. The mirror is used to make sure that the [ ] is aligned with the index marker when the compass is used to determine directions.
5. The [ ] is used in conjunction with the index marker to read of the correct direction on the azimuth ring.
6. The magnetic declination is set on the TRUEARC compass by rotating the [ ].
7. The [ ] is used to dial in a direction on the index marker.
8. The [ ] is situated on the black side of the orienteering needle outline.
9. The [ ] is used to determine the dip angle of a tabular rock body.
10. The magnetic declination is set by adjusting the position of the declination adjustment index line on the [ ].

Question 2

Two methods are used during navigation, resection whereby you can determine your position on a map, and intersection whereby you can determine the position of an object away from you on your map.

Explain the main differences between these two techniques and what is required for both of these to be used accurately in the field. (6)

Question 3

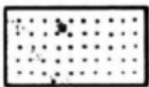

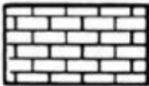
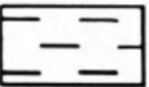
Please state if the following is true or false (6 marks):

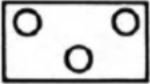
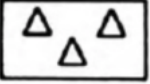
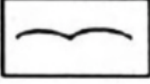

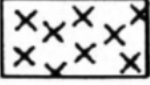
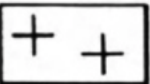

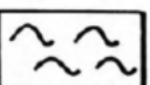
1. The magnetic declination around Johannesburg is approximately 18 degrees to the East.
2. Intersection resection is used to plot the location of an outcrop on a map when you can see the outcrop in the distance, and you know your location.

3. The dip angle of a tabular body is at its maximum in a direction 90 degrees away from the strike of the tabular body.
4. The dip direction of a planar surface is at 90 degrees to the strike of the planar surface.
5. Carbonate rocks are usually coloured red on a geological map.
6. You can determine the dip angle of a tabular rock body by adding 90 degrees to the dip direction.
7. A GPS used in conjunction with modern South African topographic maps should be set to map datum WGS 84
8. a representative fraction scale of 1/100 000 indicates that one unit on a map will be 100 000 larger than the same unit on the surface of the Earth.
9. The strike of a planar feature is the direction of 0 degrees dip angle.
10. The close proximity of a geological hammer will not influence readings taken with a compass.

#### Question 4

Match the term under column A with the phrase or word in column B by writing the corresponding number of column B next to the number of A. Please make sure that the numbers for column A is from 1 to 30 (the numbers in column B will vary). (30 marks)

A		Ans	B	
1	Map		1	Line connecting outcrops or contacts at the same elevation
2	10 millimetres		2	An exposure of bedrock
3	100 centimetres		3	1 centimetre
4	1000 meters		4	A method for navigation
5	Back bearing		5	Quartzite
6	UTM		6	1 kilometre
7	MGRS		7	Volcanic rock
8	True ground distances can be measured along a profile.		8	Claystone or mudstone
9	Map oriented		9	Example: 13°36'00"E 4291°30'N
10	Structure contour		10	Granite
11	Strike line		11	Bearing ± 180 degrees
12			12	Dolerite
13			13	Gneiss
14			14	Limestone
15			15	1 meter

A		Ans	B	
16			16	Vertical dipping
17			17	Planar feature
18			18	Breccia
19			19	A scaled two-dimensional graphic representation of a portion of the surface of the Earth
20			20	North and south directions indicated on the map align with that of north and south on the ground
21			21	No dip, horizontal layer
22			22	Sandstone
23			23	Conglomerate
24	Foliation, bedding		24	$\cos(\text{dip angle}) \times \text{vertical thickness}$
25	Mineral lineation		25	Strike line
26	On a map the geological unit forms a straight-line crosscutting contour lines		26	Example: 15S WM 60500 291300
27	On a map the contacts of the geological layer never cut across contour lines		27	Alluvium
28	Dead reckoning		28	Linear feature
29	Stratigraphic thickness		29	Shale
30	Outcrop		30	When the heights are portrayed at the same scale as the horizontal