



**SAMPLE COASTAL SKIPPER CHARTWORK QUESTIONS**

Updated 17 October 2008

- Unless otherwise specified, all chartwork questions relate to chart SAN 3002.
- Some questions may ask you to use deviation card No1 for your yachts steering compass:

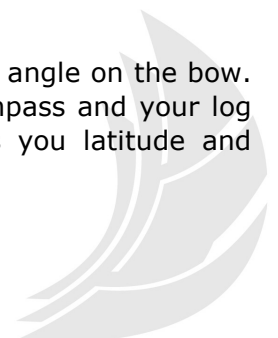
DEVIATION CARD No1						
COMPASS	DEVIATION	MAGNETIC		COMPASS	DEVIATION	MAGNETIC
000°	8° E	008°		180°	8° W	172°
023°	6° E	029°		202°	6° W	196°
045°	4° E	049°		225°	4° W	221°
067°	2° E	069°		247°	2° W	245°
090°	0°	090°		270°	0°	270°
112°	2° W	110°		292°	2° E	294°
135°	4° W	131°		315°	4° E	319°
158°	6° W	152°		337°	6° E	343°
180°	8° W	172°		000°	8° E	008°

**INTERCEPTION**

1. You are at 34° 00'S and 18° 10'E. Your target is at 33° 50'S and 18° 20'E sailing 270°M at 4 knots. If you can do 7 knots, what is your CTS to intercept the target and how long will it take to meet?
2. You are at 34° 15'S and 18° 45'E. Your target is 34° 10'S and 18° 43'E sailing 260°T at 4 knots. If you can do 6 knots, what is you CTS to intercept the target and how long will it take to meet?
3. Your target is 34° 11'S and 18° 32'E heading 195°T at 3.4 knots. You are 34° 19'S and 18° 40E and can do 4.2 knots. What is you CTS to intercept your target and how long will it take?
4. Your target is 33° 50S and 18° 10E heading 110°T at 3 knots. You are at 34°S and 18° 11E and can do 11 knots. What is your CTS to intercept your target and how long will it take?
5. At 1800 your target is at 34° 20'S and 18° 43'E heading 140°T at 4 knots. You are at 34° 22'S and 18° 37'E and can do 6 knots. What is your CTS to intercept your target and how long will it take?

**DOUBLE ANGLE ON THE BOW**

6. You are sailing 330°C and you decide to fix you position by doing a double angle on the bow. You zero your log when Whittle Rock bears 300°C on your hand held compass and your log reads 1.6M. Your compass has no deviation. Fix your position. What is your latitude and longitude?



7. You are sailing  $070^{\circ}\text{C}$  and you decide to fix your position by doing a double angle on the bow. You zero your log when Cape Point Light bears  $030^{\circ}\text{C}$  on your hand held compass. At 1323 Cape Point Light bears  $350^{\circ}\text{C}$  on your hand held compass and your log reads 5.6M. Your compass has no deviation. Fix your position. What is your latitude and longitude?

## **RUNNING FIX**

8. You are sailing  $210^{\circ}\text{C}$ . Your steering compass has zero deviation. At 1000 Karbonkelberg bears  $143^{\circ}\text{C}$  on your hand held compass and your log reads 4.7M. At 1037 your log reads 8.8M and Karbonkelberg bears  $085^{\circ}\text{C}$  on your hand held compass. What is your latitude and longitude?
9. You are sailing  $010^{\circ}\text{C}$ . Your steering compass has zero deviation. At 1000 Slangkop Light bears  $055^{\circ}\text{C}$  on your hand held compass and your log reads 5.1M. At 1037 your log reads 8.7M and Slangkop Light bears  $095^{\circ}\text{C}$  on your hand held compass. Fix your position. What is your latitude and longitude?
10. You are sailing  $330^{\circ}\text{C}$ . Your steering compass has zero deviation. You decide to do a double angle of the bow on Roman Rock Light. At 2100 the light bears  $300^{\circ}\text{C}$  on your hand held compass and you zero your log. You get distracted and forget to read the log when the light bears  $270^{\circ}\text{C}$ . At 2137 your log reads 2.71M and Roman Rocks bear  $255^{\circ}$  on your hand held compass. Plot your position at 2137. What is your latitude and longitude?
11. A yacht is sailing  $110^{\circ}\text{T}$ . At 1300 the navigator takes a bearing of  $050^{\circ}\text{T}$  on Hangklip light and zeros his log. At 1400 the navigator takes a second bearing of  $010^{\circ}\text{T}$  on Hangklip light and reads his log which says 6.0 nm.

First consider navigator A who does not think there is a current. Plot your position A at 1400. Then consider navigator B who thinks there is a current of 2.6 knot setting  $320^{\circ}\text{T}$ . Plot your position B at 1400. How far off Hangklip light does navigator A and B respectively think they are at 1400?

12. You are sailing  $350^{\circ}\text{C}$ . Your steering compass has zero deviation. You decide to do a double angle of the bow on Cape Point Lighthouse. At 2100 the light bears  $320^{\circ}\text{C}$  on your hand held compass and you zero your log. You get distracted and forget to read the log when the light bears  $290^{\circ}\text{C}$ . At 2137 your log reads 2.71M and Cape Point Lighthouse bears  $275^{\circ}\text{C}$  on your hand held compass. Plot your position at 2137. What is your latitude and longitude?
13. A yacht is sailing  $150^{\circ}\text{T}$  in False Bay. At 1300 the navigator takes a bearing of  $190^{\circ}\text{T}$  on Whittle Rock buoy and zeros his log. At 1400 the navigator takes a second bearing of  $230^{\circ}\text{T}$  on Whittle Rock buoy and reads his log which says 6.0nm.

First pretend you are navigator A who does not think there is a current. Plot your position. Then pretend you are navigator B who thinks there is a current of 2.1 knot setting  $300^{\circ}\text{T}$ . Plot your position. How far off Whittle Rock does navigator A and B respectively think they are at 1400?

14. A yacht is sailing  $340^{\circ}\text{T}$ . At 2100 the navigator takes a bearing of  $050^{\circ}\text{T}$  on Slangkop light and zeros his log. At 2200 the navigator takes a second bearing of  $130^{\circ}\text{T}$  on Slangkop light and reads his log which says 5.4 nm.  
First consider navigator A who does not think there is a current. Plot his position A at 2200. Then consider navigator B who thinks there is a current of 2.2 knot setting  $130^{\circ}\text{T}$ . Plot his position B at 2200. How far off Slangkop light do navigator A and B respectively think they are at 2200?



15. A yacht is sailing  $140^{\circ}\text{T}$ . At 1100 the navigator takes a bearing of  $080^{\circ}\text{T}$  on Cape Point Lighthouse and zeros his log. At 1200 the navigator takes a second bearing of  $040^{\circ}\text{T}$  on Cape Point Lighthouse and reads his log which says 6.0 nm.

First consider navigator A who does not think there is a current. Plot your position A at 1200. Then consider navigator B who thinks there is a current of 2.6 knot at setting  $350^{\circ}\text{T}$ . Plot your position B at 1200. How far off Cape Point Lighthouse do navigator A and B respectively think they are at 1200?

### DIPPING THE LIGHT

16. At 0312 you see Robben Island light dipping at  $050^{\circ}\text{C}$  on your hand held compass. You estimate the height of your eye to be 3.2m. Plot your position. What is your latitude and longitude?
17. At 0422 you see Hangklip light dipping at  $095^{\circ}\text{C}$  on your hand held compass. You estimate the height of your eye to be 3m. Plot your position. What is your latitude and longitude?
18. At 0425 you are sailing  $210^{\circ}\text{C}$  and you see Slangkop light dipping at  $027^{\circ}\text{C}$  on your hand held compass. The height of your eye above water is about 3m. Plot your position. What is your latitude and longitude? Deviation card No. 1 applies to your ship's compass.
19. You are sailing  $180^{\circ}\text{C}$ . At 0300 you see Milnerton Light bearing  $131^{\circ}\text{C}$  on your hand held compass and dipping. You estimate your height of eye to be 3m above sea level. Plot your position. What is your latitude and longitude? Deviation card No.1 applies to your ship's compass.

### RULE OF TWELFTHS

20. The bar at the entrance to your marina at Dar es Salaam has charted depth of 1.6m. Your keel has a draft of 2.1m and you require a clearance of 0.5m. What is the latest time before the 1712 LT that you can enter the marina? HT 1000 @ 3.9m. LT 1712 @ 0.3m. Note that the transducer of your echo sounder is installed 0.4m below water level.
21. The bar at the entrance to your marina has a charted depth of 0.9m. Your keel has draft of 1.6m and you require a clearance of 0.5m. What is the earliest time after the 0900 LT that you can enter the marina? LT 0900 @ 0.33m. HT 1512 @ 1.89m. Note that the transducer of your echo sounder is installed 0.4m below water level.
22. Your tide table gives you the following information: LT 0931 0.43m HT 1625 2.11m  
What will the height of the tide be at 1200? When will the tide be 1.8m?

### GENERAL

#### 23. Use variation = $24^{\circ}\text{W}$ and dev card No 1 for your ship's compass.

- a. You are sailing  $315^{\circ}\text{C}$  on your ship's compass. At 1100 you zero your log. Cape Point bears  $046^{\circ}\text{C}$  on your hand held compass. At 1130 your log reads 4.4 nm and Cape Point bears  $089^{\circ}\text{C}$  on your hand held compass. Plot your fix. What is your position?
- b. At 1130 you decide to change course to get to waypoint A which is 3 nm due West of Slangkop light. What is your compass course to steer? What is your ETA at A assuming a speed of 9 knots?
- c. At 1230 you fix your position by  $34^{\circ} 16.0'\text{S}$  and  $18^{\circ} 15.6'\text{E}$  and your log reads 13.4 nm. What is the set, drift and rate of the current been since 1130?
- d. Your skipper wants to get back onto your original course by 1300. What is your CTS to get back onto your original course to A by 1300, assuming the current remains the same, and you continue to log 9 knots? What is your expected SOG?

**24. You have zero deviation on your compass..**

- a. You are sailing 240°C. At 1100 Steenbras river mouth bears 086°C and Rooielsberg bears 171°C on your hand held compass. Plot your fix. What is your position?
- b. You immediately decide to change course to get to waypoint A which is 34° 30'S and 18° 40'E. Assuming a speed of 8 knots, what is your compass CTS and your ETA at your waypoint?
- c. At 1130 you fix your position by GPS at 34° 17.2'S and 18° 47.1'E. What has the set, drift and rate of the current been since 1100?
- d. Your skipper wants to get back onto your original course to waypoint A by 1200. Assuming the current remains the same and your speed through the water remains 8 knots, what is your compass CTS and your expected SOG?

**25. Use variation = 24°W and dev card No 1 applies to your ships compass...**

- a. You are sailing 230°C on your ships compass. At 0730 Steenbras River mouth bears 138°C on your hand held compass and you zero your log. At 8000 your log reads 3.2nm Steenbras River mouth bears 086°C on your hand held compass. Plot your fix. What is your position?
- b. At 0800 you decide to change course to get to waypoint A which is 2 nm due West of Hangklip light. What is your compass course to steer? What is your ETA at waypoint A assuming a speed of 6 knots?
- c. At 0830 your log reads 6.3 nm and you fix your position by GPS at 34° 17.1'S and 18°44.0'E. What has the set, drift and rate of the current been since 0800?
- d. You still want to get to waypoint A. What is your CTS to get to waypoint A assuming the current remains the same? Assume a speed through the water 6 knots. What is your expected SOG and your ETA at waypoint A?

**26. Use variation = 24°W and dev card No 1 for your ships compass...**

- a. You are sailing 170°C on your ships compass. At 1930 your log reads 7.1 nm and Roman Rock light bears 239°C on your hand held compass. At 2000 your log reads 9.9 nm and Roman Rocks light bears 309°C on your hand held compass. Plot your fix. What is your position at 2000?
- b. At 2000 you decide to change course to get to waypoint A which is 3 nm due East of Cape Point light. What is your compass course to steer? What is your ETA at A assuming a speed of 6 knots?
- c. At 2030 you fix your position by GPS 34° 15.1'S and 18° 30.2'E and your log reads 13.0 nm. What has the set, drift and rate of the current been since 2000?
- d. You still want to get to waypoint A. Assuming the current remains the same, and you continue to log 6 knots through the water, what is your compass CTS and your expected SOG? What is your ETA?



## CHART APPRECIATION

### 27. On chart SAN 3002

- a. What would you expect the compass variation to be in False Bay in degrees and minutes in 2020?
- b. Can GPS position be plotted directly or do they need to be adjusted first? How do you know? What horizontal datum have they used for the chart?
- c. What is the set and rate if the tidal stream at diamond D 3 hours before spring high tide?

### 28. On chart SAN 2003, what is the charted depth at Anvil Rock off Cape Point?

What would the depth be at MLWN?

## BEARINGS TAKEN WITH THE SHIP'S STEERING COMPASS

### 29. Deviation Card No 1 applies to your ships steering. Your Local variation is 24°W.

- a. While sailing 340°C on your ships steering compass, you take three bearings using the azimuth ring on your ship's compass. The bearings are 033°C, 137°C and 232°C. Covert these bearing from compass to true.
- b. You have dropped your hand bearing compass overboard. So you take three bearing on your ship's steering compass by pointing your bows at the charted landmarks. The bearings are 033°C, 137°C and 232°C. Convert these bearing from compass to true.

### 30. Deviation card no 1 applies to your ships steering compass. Your local variation is 24°W.

- a. While sailing 190°C on your ships steering compass, you take three bearings using the azimuth ring from your ship's compass. The bearings are 082°C, 193°C, and 317°C. Convert these bearings from compass to true.
- b. You have dropped your hand bearing compass overboard. So you take three bearing on your ship's steering compass by pointing your bows at the charted landmarks. The bearings are 082°C, 193°C and 317°C. Convert these bearing from compass to true.

