GRADE 11 ESSENTIAL
UNIT G – TRIGONOMETRY
SINE AND COSINE LAW WORD PROBLEMS

Name: _____
Date: _____

1. Alfred and Bruce live on Planets ALPHA and BRAVO *respectively* and are separated by **5.2** light-years[1]. They have discovered a new life-form his name is 'Randy', he lives on the planet DUSTBOWL. To Alfred, DUSTBOWL is 50° to the left of planet BRAVO. To Bruce, DUSTBOWL is 60° to the right of planet ALPHA. How far away is Randy from Alfred in light years and in km?

2. Brandon and Melissa are out in the bush; each of them has a compass. They also have a walkie-talkie that only works for a maximum distance of **3.2** km. Brandon walks for 5.0 km on a compass bearing of 020° from North and stops. Melissa walks for 6.0 km on a compass bearing of 060° from North and stops. Will Brandon and Melissa be able to talk to each other on the walkie-talkies?

[1] 5.2 Light-years is a very long distance. It is the distance a light beam would travel in one year. Light travels 300,000 km per second!

3. Kellen is in the bush at Point CHARLIE. He has to get to point DELTA which is 7 km away but there is a huge swamp in the way. The swamp has 35 crocodiles in it. He decides to set off at an angle off 45° to the left of the desired direction of DELTA and he walks for 5 Km in that direction.

a. How far does he have to go to get to DELTA?

b. In what direction will he have to go to get to DELTA?

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4. Andrea is out for a walk in the prairies. She walks 10 km in a straight line, then turns 60° to her left and walks another 8 km.

a. What distance did she walk total?

b. How far is she displaced from where she started?

5. A boat crew calls into the rescue centre on Channel 16 Marine distress frequency: “help I am lost and slowly sinking”. The boat crew says that they went east (90° on a compass) for 10 km from Jackhead, then they went Northwest (315° bearing) for 8 km.

a. How far is the boat from Jackhead; and

b. what compass angle from Jackhead do we go to rescue the boat?

6. The police are investigating a violent crime. The suspect made a certain phone call from a certain place and the police want to prove he was there. From cell phone data from cell phone towers A and B the police can tell that the suspect was 60° to the right of a line connecting cell phone towers A and B from Tower A and 40° to the left of B to A from Tower B. The two towers are 10 km apart. They use this information to ‘triangulate’ the position of the suspect. What is the suspect’s position from point A? (angle *and* distance)