



Trigonometry #7

1. Convert the following compass directions to 3 figure bearings (to the nearest whole degree):
(It may help to draw a compass "rose" so you can work out the points)
 - a) SSE _____
 - b) SW _____
 - c) NNE _____
 - d) WSW _____
2. What is the nearest compass point to:
 - a) Bearing 158° _____
 - b) Bearing 335° _____
 - c) 4 o'clock _____
 - d) 8 o'clock _____
3. A plane flies due north. What is the bearing of a target at:
 - a) 9 o'clock _____
 - b) 7 o'clock _____
 - c) 2 o'clock _____
 - d) 6 o'clock _____
4. Ted flies his plane from his base on a bearing of 080° . After 3km, his radar shows another plane at 9 o'clock. The second plane is due north of the base. How far is the second plane from Ted?
(Draw a clear, labelled diagram to help you do this question. Write your answer to 2 decimal places and don't forget units!)
5. A ship sails due west from a harbour for 20km, then due south for 30km. At what bearing is the ship from the harbour?
(Draw a clear, labelled diagram to help you do this question. Write your answer to the nearest degree)

Trigonometry #7 - Answers

1. Convert the following compass directions to 3 figure bearings (to the nearest whole degree):

(It may help to draw a compass "rose" so you can work out the points)

Remember, each cardinal point (NESW) is 90° , each half point (NE etc) is 45° , and each quarter point (NNE etc) is 22.5° .

a) SSE $7 \times 22.5 = \underline{157.5^\circ}$

b) SW $5 \times 45 = \underline{225^\circ}$

c) NNE $1 \times 22.5 = \underline{22.5^\circ}$

d) WSW $11 \times 22.5 = \underline{247.5^\circ}$

2. What is the nearest compass point to:

Remember also that each hour is 30° .

a) Bearing 158° $158 \div 22.5 = 7.02 \approx \underline{\text{SSE}}$

b) Bearing 335° $335 \div 22.5 = 14.89 \approx \underline{\text{NNW}}$

c) 4 o'clock $4 \times 30 = 120$; $120 \div 22.5 = 5.33$
(closer to 5 than 6) $\approx \underline{\text{ESE}}$

d) 8 o'clock $8 \times 30 = 240$; $240 \div 22.5 = 10.67 \approx \underline{\text{WSW}}$

3. A plane flies due north. What is the bearing of a target at:

a) 9 o'clock $9 \times 30 = \underline{270^\circ}$

b) 7 o'clock $7 \times 30 = \underline{210^\circ}$

c) 2 o'clock $2 \times 30 = \underline{060^\circ}$

d) 6 o'clock $6 \times 30 = \underline{180^\circ}$

4. Ted flies his plane from his base on a bearing of 080° . After 3km, his radar shows another plane at 9 o'clock. The second plane is due north of the base. How far is the second plane from Ted?

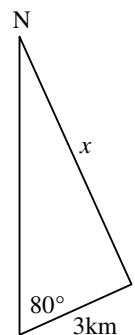
(Draw a clear, labelled diagram to help you do this question. Write your answer to 2 decimal places and don't forget units!)

You should have a diagram similar to the one at right. We know the side adjacent to the angle, and want the side opposite.

$$\tan 80^\circ = x/3$$

$$x = 3 \tan 80^\circ$$

$$x = \underline{17.01\text{km}}$$



5. A ship sails due west from a harbour for 20km, then due south for 30km. At what bearing is the ship from the harbour?

(Draw a clear, labelled diagram to help you do this question. Write your answer to the nearest degree)

$$\tan \alpha = 30/20 = 3/2 = 1.5; \alpha = \tan^{-1} 1.5$$

$$\alpha = 56.3^\circ \text{ Note: that's the angle south of west (see diagram)}$$

The angle round from the north going anti-clockwise is $90^\circ + 56.3^\circ = 146.3^\circ$;

The angle going clockwise from north (bearing) is $360^\circ - 146.3^\circ = \underline{213.7^\circ}$.

