

MATH 100 – WORKSHEET 20
RELATED RATES

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(1) Two ships are travelling near an island. The first is located 20km due west of it and is moving due north at 5km/h. The second is located 15km due south of it and is moving due south at 7km/h. How fast is the distance between the ships changing?

(2) The same setting, but now the first ship is moving toward the island.

- (3) A conical drain is 6m tall and has radius 1m at the top.
- (a) The drain is clogged, and is filling up with rain water at the rate of $5\text{m}^3/\text{min}$. How fast is the water rising when its height is 5m?
 - (b) Once the drain is unclogged the water begins to clear at the rate of $15\text{m}^3/\text{min}$ (but rain is still falling!). At what height is the water falling at the rate of $40\text{m}/\text{min}$.