

# Classroom to Campus: Math and Stats Challenge

## Grade 10 - MFM2P

### Topic B: Modelling Linear Relations Comparing Career Growth at Two Companies

David and Emily are recent graduates with comparable qualifications but have chosen different career paths. David has been hired by TechCorp, while Emily has joined Innovate Inc. Both companies offer annual salary packages that grow with experience, but their initial salaries and increments differ. The two friends are curious to compare their earning trajectories and determine if, and when, their salaries will converge.

- David's annual salary ( $S_D$ ) at TechCorp is given by:  
$$S_D = 40\,000 + 2000t$$
where  $t$  represents the number of years he has been employed by the company.
  - Emily's annual salary ( $S_E$ ) at Innovate Inc is given by:  
$$S_E = 30\,000 + 2500t$$
where  $t$  represents the number of years she has been employed by the company.
- a) Determine the number of years it will take for David's and Emily's salaries to become equal. *(Round your final answer to the nearest integer.)*
  - b) Determine their salaries at that time. *(Round your final answer to the nearest cent.)*
  - c) Calculate the total earnings for both David and Emily over 10 years. Who will have earned more by the end of this period, and by how much? *(Round your final answer to the nearest cent.)*
  - d) If David plans to stay at TechCorp for 12 years and Emily at Innovate Inc. for 15 years, calculate their total earnings over their respective periods. Who would earn more overall, and by what amount? *(Round your final answer to the nearest cent.)*

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