

TOPIC 11: LEARNING CURVES

Practice Problems

1. Suppose that the cost to produce the first unit of a product is \$800, and the firm expects to experience a 78% learning rate. What should the 50th unit cost?
2. Suppose that the first unit of a product costs a firm \$200, and the 10th unit costs \$175. What should the 70th unit cost?
3. If the 4th unit took 24 hours to produce, and the 20th unit took 19 hours to produce, what would the learning rate be?
4. Suppose that the first unit of a product took 60 labor hours to produce. The company expects to produce and sell 80 units in year one and 195 units in year two. If the firm experiences a 60% learning rate, how many labor hours will the company need to allocate in year two to produce the product?
5. A maintenance activity took 60 minutes for the first repair, and historical records suggest that this activity follows a 70% learning curve. Estimate:
 - a. the time required to complete the fourth repair, and
 - b. the total time required to complete all four repairs.
6. A change in work methods has resulted in a new assembly job, which must be done several times per shift. A capable worker took 50 minutes to complete the job the first time and 45 minutes the second time. Find:
 - a. the learning rate r , and
 - b. the time the worker should take to complete the 20th assembly.
7. It requires 100 minutes for a worker to complete the first unit of a toy car model, but only 41 minutes for unit 16. What is the learning rate r ?
8. Production of a certain type of television series program follows an 80% learning curve and requires 100 hours to complete the first unit. Find the time required to complete the fourth unit of the series.
9. It requires 70 minutes for a worker to assemble the 5th unit of an electronic device, but only 50 minutes for the 10th unit. What is the learning rate r ?
10. It is now 6:00 p.m. and Joe starts doing his calculus homework. He wants to finish it before 7:30 p.m. so he can watch the movie with his girlfriend (she will not go to movie with him if he cannot finish the homework before 7:30 p.m.). The homework has 15 problems. Assume that Joe has a learning rate of 60% and each problem has the exact same difficulty level. It takes Joe 20 minutes to figure out the first problem.
 - a. Estimate the time that Joe will spend solving the 15th problem.
 - b. Is it likely that Joe can watch the movie with his girlfriend tonight? Explain your answer with necessary math support.