

Let's break it down step by step! (NOTE: This solution is 2 pages)

Step 1: Total trips required

Lisa's **CAT 797F Dump Truck** hauls **400 tons per trip**, and she needs to transport **15,000 tons** of ore.

Total trips needed: $15,000 \div 400 = 37.5$ trips Since she can't make a half-trip, Lisa will need **38 full trips** to move all the ore.

Step 2: Total time per round trip

Each trip covers **10 miles one way**, meaning a **20-mile round trip**.

- For the **first 2 miles**, Lisa slows down to **25 mph** due to terrain.
 - Time for 2 miles = $2 \div 25 = 0.08$ hours (4.8 minutes)
- For the remaining **8 miles**, she drives at **35 mph**.
 - Time for 8 miles = $8 \div 35 = 0.23$ hours (13.7 minutes)
- Total driving time per trip = $4.8 + 13.7 = 18.5$ minutes

Adding load/unload time:

- Loading: **15 minutes**
- Unloading: **10 minutes**
- Total per trip (including driving): $18.5 + 15 + 10 = 43.5$ minutes (0.73 hours)

Step 3: Total work time needed

Lisa must complete **38 trips**, each taking **0.73 hours**.

Total hauling time: $38 \times 0.73 = 27.74$ hours

Step 4: Can Lisa finish within 7 hours?

Lisa only has **7 hours** left. Since the total required is **27.74 hours**, she cannot finish on time **unless additional trucks or faster methods are introduced**.



Step 5: Impact of losing 45 minutes

If Lisa loses **45 minutes** due to delays:

- **7 hours – 0.75 hours = 6.25 hours** available.
- In **6.25 hours**, she can complete **$6.25 \div 0.73 \approx 8.5$ trips**.

At that rate, she will **only transport about 3,400 tons of ore**, falling far short of the 15,000-ton target.

Conclusion: Lisa needs backup trucks or an extended shift to complete the haul. Otherwise, she won't meet the deadline!