Charging the battery cart

Linear models | cost comparison

Name _____ Date _____

A school rents a portable battery cart. Plan A costs $18 plus $4 per hour. Plan B costs $7 per hour. Rental time is recorded in whole hours.

1. Write both cost functions and find their intersection.

2. For which allowed hours is A strictly cheaper? Justify the boundary.

3. A student says A is cheaper at six hours. Evaluate the claim.

Use evidence and show the relationships in your reasoning. Additional paper is permitted.

Raised garden arch

Quadratic structure | equation and interval

Name _____ Date _____

A decorative arch is modeled by h(x)=-x^2+10x feet above a walkway. x is horizontal distance from one ground contact.

1. Find both ground contacts and the maximum height.

2. Find where the arch is at least 16 feet high. Show how the inequality relates to the roots.

3. State a physically meaningful domain.

Use evidence and show the relationships in your reasoning. Additional paper is permitted.

Two receipt checks

Systems and constraints | paired receipts

Name _____ Date _____

Receipt A lists 2 sandwiches and 3 drinks for $25. Receipt B lists 4 sandwiches and 1 drink for $35. Prices are the same on both receipts.

1. Test the proposed prices $8 per sandwich and $3 per drink against both receipts.

2. Solve for the prices and verify both receipts.

3. Explain why a single matching receipt is insufficient.

Use evidence and show the relationships in your reasoning. Additional paper is permitted.

Same center, different repair times

Statistics | two distributions

Name _____ Date _____

Two repair teams record completion times in minutes for five identical routine jobs.

Job	A	B
1	8	1
2	9	9
3	10	10
4	11	11
5	12	19

1. Compute the mean and median for each team.

2. Compare spread using the range and describe a limitation of the comparison.

3. Choose a team if predictable completion is the only criterion, and support your choice.

Use evidence and show the relationships in your reasoning. Additional paper is permitted.

Labels on an exponential model

Growth and functions | model comparison

Name _____ Date _____

A tank model gives C(t)=80(0.75)^t milligrams of dissolved material after t whole filtration cycles. A second model gives D(t)=80-20t.

1. Interpret 80 and 0.75 in C.

2. Compare the models at t=1 and t=2.

3. Explain why D becomes unreasonable after enough cycles.

Use evidence and show the relationships in your reasoning. Additional paper is permitted.

Measuring foam panels

Quantities and precision | unit conversion

Name _____ Date _____

A shop buys foam at $6 per square meter. One rectangular panel measures 120 cm by 50 cm. An order requires 20 panels, with no waste allowance.

1. Convert the dimensions to meters and find one panel area.

2. Find the material cost for the order.

3. Explain the error in multiplying 120 by 50 and treating the result as square meters.

Use evidence and show the relationships in your reasoning. Additional paper is permitted.