Two delivery plans

Suggested time for the entire exam: 35–50 min; adjust to local conditions.

Name _____ **Date** _____

For n whole deliveries, Route A costs 12 + 3n dollars and Route B costs 5n dollars. A shop can order from either route.

1. What does 12 represent for Route A?

- ○ A The number of free deliveries
- ○ B The price per delivery
- ○ C The fixed charge before any deliveries
- ○ D The largest order allowed

2. Which range makes Route B strictly cheaper?

- ○ A Exactly 6 deliveries
- ○ B 0 through 5 deliveries
- ○ C 6 or more deliveries
- ○ D More than 6 deliveries

3. A manager claims the plans always differ by $12. Test the claim at two order sizes and explain why the difference changes.

An arch in the courtyard

Use the stimulus and your course knowledge.

Name _____ **Date** _____

The height of a model arch is $h(x) = -x^2 + 8x$ feet, where x is horizontal distance in feet, measured from the left base. Use the portion on or above the ground.

4. Which expression is equivalent to h(x)?

- ○ A $-x(x + 8)$
- ○ B $x(x - 8)$
- ○ C $(8 - x)^2$
- ○ D $x(8 - x)$

5. Which interval is the physical domain?

- ○ A All real numbers
- ○ B $0 \le x \le 16$
- ○ C $-8 \le x \le 8$
- ○ D $0 \le x \le 8$

6. An opening must be at least 12 feet high. Find the full interval of horizontal positions that satisfy the requirement and justify both endpoints.

Two sets of repair times

Use the stimulus and your course knowledge.

Name _____ **Date** _____

Shop A recorded five repair times in minutes: 8, 9, 10, 11, 12. Shop B recorded 4, 7, 10, 13, 16. Times within each set are equally weighted.

7. Which statistic has the same value for both shops?

- ○ A Standard deviation
- ○ B Median
- ○ C Range
- ○ D Maximum

8. If A adds a 40-minute repair, what is its new mean?

- ○ A 15 minutes
- ○ B 18 minutes
- ○ C 10.5 minutes
- ○ D 9 minutes

9. Before the extra repair, a supervisor said the shops were equally consistent because their means matched. Evaluate the reasoning using numerical evidence.

Admission at the winter show

Use the stimulus and your course knowledge.

Name _____ **Date** _____

On Friday, 3 adult tickets and 2 student tickets cost $58 altogether. On Saturday, 2 adult tickets and 5 student tickets cost $79. Individual prices were the same on both days.

10. What does the coefficient 5 represent in the Saturday equation?

- ○ A Number of student tickets
- ○ B Number of adult tickets
- ○ C Total Saturday student revenue
- ○ D Price of each student ticket

11. If a student ticket price were given, which information would still be needed to find an adult price from the Friday receipt?

- ○ A Only the number of days
- ○ B Only the combined number of Friday tickets
- ○ C Friday total and both Friday quantities
- ○ D Only the Saturday student quantity

12. A buyer proposes $10 per adult and $14 per student. Define variables, model both receipts, test the proposal against both, and solve for the actual prices. Verify your final pair.