Modeling and Word-Problem Translation

Turning contexts into equations, inequalities, tables, and graphs.

Name _____ Date _____

32 main · 2-up grid · 2 pages

Completion Reward

Shown here as a small pack artifact, not a preview destination.

1. Which variable definition is best for a ticket problem?

A. Let x be the number of tickets sold.
B. Let x be the answer and the question at the same time.
C. Do not define a variable.
D. Let x be the ticket price and the ticket count simultaneously.

2. If x represents the number of tickets sold, which answer is not reasonable?

A. -2.5
B. 12
C. 0
D. 18

3. A problem is about buying packs of notebooks. Which variable definition is best?

A. Let p be the price of one notebook and the number of packs at the same time.
B. Let n be the word notebook.
C. Let p be the number of packs of notebooks.
D. Let x be the answer with no units in mind.

4. Which equation matches the sentence Three fewer than twice x is 11?

A. 3x - 2 = 11
B. 2(x - 3) = 11
C. x - 3 = 22
D. 2x - 3 = 11

5. Which expression means 8 less than 3x?

A. 8 - 3x
B. 3(x - 8)
C. 8x - 3
D. 3x - 8

6. A student lets x be the number of boxes but then solves for x and interprets it as the cost in dollars. What is wrong?

A. Variables are not allowed in word problems.
B. x should always mean dollars.
C. The interpretation does not match the variable definition.
D. The answer should be squared first.

7. Which family best models the height of a ball thrown upward over time?

A. Linear
B. Exponential
C. Quadratic
D. Constant

8. If s is the side length of a square, which equation gives its area A?

A. A = 4s
B. A = 2s
C. A = s + s
D. A = s^2

9. A gym charges a $25 sign-up fee and $15 each month. Which equation models the total cost C after m months?

A. C = 15 + 25m
B. C = 25m
C. C = 40m
D. C = 25 + 15m

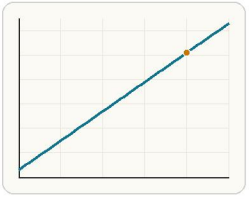
10. Which situation is best modeled by a quadratic relationship?

A. The cost of 4 notebooks at $2 each
B. The total after adding 5 each week
C. The height after halving each hour
D. The area of a square as a function of its side length

11. A bacteria culture starts at 50 and triples each hour. Which equation models the amount y after h hours?

A. y = 50(3^h)
B. y = 50 + 3h
C. y = 3(50^h)
D. y = 150h

12. If y = 12x + 3 gives the total movie-ticket cost and x = 4, what does y = 51 mean?



The point at x = 4 shows the total cost for 4 tickets.

A. The ticket price is $51 each
B. There are 51 tickets
C. The booking fee is $51
D. The total cost for 4 tickets is $51

13. A student chooses an exponential model for a cost that increases by $4 each week. What is wrong?

A. Exponential models are always better than linear ones.
B. Weekly changes can never be modeled.
C. The situation should be quadratic instead.
D. A constant increase fits a linear model, not an exponential model.

14. A student picks a linear model for a population that doubles each year just because the problem uses the word grows. What is wrong?

A. Any growth must be linear
B. Population problems can never use functions
C. Doubling each year is multiplicative, so the model should be exponential
D. Nothing is wrong

15. A student solves a ticket problem and gets -3 tickets. What is the issue?

A. The result is mathematically possible but not reasonable in context
B. Negative answers are always the best answers
C. Tickets must be fractions
D. There is no issue

16. A streaming plan costs $9 plus $3 per movie. If the total is $24, how many movies were watched? Answer with a number.

17. A tank starts with 70 gallons and drains 5 gallons per minute. After how many minutes will it reach 20 gallons? Answer with a number.

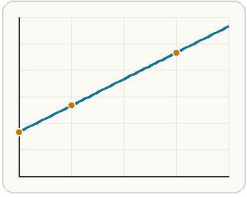
18. A babysitter charges $12 per hour plus an $8 travel fee. If the total bill is $44, how many hours did the babysitter work? Answer with a number.

19. **A runner is 10 miles from home and moves toward home at 0.5 mile per minute. What is the distance from home after 6 minutes? Answer with a number.**

20. **Which answer is most reasonable for the number of student tickets sold if 12 tickets were sold total?**

A. 8.5 tickets
B. 4 tickets
C. -2 tickets
D. 40 tickets

21. **What does the slope mean in this situation?**



The line starts at $25 and rises by $15 each hour.

A. $25 per hour
B. The ride starts at $15
C. $15 per hour
D. The ride lasts 25 hours

22. **A car loses the same percent of its value each year. Which family best models the value?**

A. Linear growth
B. Quadratic
C. Exponential decay
D. Constant

23. **A medicine dose is cut in half every 6 hours. Which family best models the amount remaining?**

A. Exponential decay
B. Linear
C. Quadratic
D. Constant

24. **A rectangular garden is 4 feet longer than it is wide. If the width is w, which expression gives the area?**

A. 2w + 4
B. w + 4
C. 4w
D. w(w + 4)

25. **A parking garage charges $6 to enter plus $2 per hour. Which model gives total cost y after x hours?**

A. y = 6x + 2
B. y = 2x + 6
C. y = 2(x + 6)
D. y = 6 - 2x

26. **A gym charges a $25 sign-up fee and $18 per month. Which equation gives total cost y after x months?**

A. y = 25x + 18
B. y = 43x
C. y = 18x + 25
D. y = 18x - 25

27. **A bacteria culture starts at 12 and doubles each day. Which model gives y after x days?**

A. y = 12(2^x)
B. y = 2x + 12
C. y = 12x^2
D. y = 24x

28. **A candle is 18 centimeters tall and burns down 2 centimeters each hour. Which equation gives height h after t hours?**

A. h = 2t + 18
B. h = 18(0.8^t)
C. h = t^2 + 18
D. h = 18 - 2t

29. **Movie tickets cost $12 each plus a one-time booking fee of $3. Write an equation for total cost y in terms of number of tickets x. Answer in the form y = ...**

30. **A rumor triples its reach each hour. Which family best models the situation?**

A. Linear
B. Exponential
C. Quadratic
D. Constant

31. **A ball is thrown upward and then falls back down. Which family best models height versus time?**

A. Linear
B. Exponential
C. Quadratic
D. Constant

32. **Adult tickets cost $10 and student tickets cost $6. A group buys 12 tickets for $96. Let a be adult tickets and s be student tickets. Write the system as two equations.**