



PROJECT: APPROVAL IN THE SCHOLASTIC ASSESSMENT TEST (SAT)

Professor Elias



✓ SAT Math Placement Levels (Based on 15 Questions)

Use the number of correct answers to classify the student into one of four preparation levels.

■ Level 4 — Advanced (13–15 correct)

Description:

- ✓ Excellent mastery of SAT Math (Heart of Algebra, P.S.D.A., Geometry, Trig).
- ✓ Student is ready for high-difficulty SAT practice and time-pressure drills.
- ✓ Recommended path: timed mock tests, advanced problem solving, tricky algebra & functions.

■ Level 3 — Proficient (10–12 correct)

Description:

- ✓ Solid understanding of core SAT topics.
- ✓ May struggle only on multi-step or high-level reasoning problems.
- ✓ Recommended path: refine weak areas, increase speed, solve medium–hard sets daily.

■ Level 2 — Basic (6–9 correct)

Description:

- ✓ Understands fundamentals but shows inconsistent problem-solving accuracy.
- ✓ Gaps in algebra, percentages, geometry, or function interpretation.
- ✓ Recommended path: structured review of core SAT content + guided practice.

■ Level 1 — Beginner (0–5 correct)

Description:

- ✓ Needs foundational reinforcement before attempting full SAT material.
- ✓ Struggles with algebraic manipulation, ratios, percent change, and geometry basics.
- ✓ Recommended path: skill-building lessons, step-by-step practice, slower progression.

★ How to Use This Ranking

1. Give the student the 15-question test.
2. Count correct answers.
3. Assign the student to one of the four levels above.
4. Build a personalized study plan based on the level.



SAT Knowledge Diagnostic Test

● Heart of Algebra — Linear Equation

1) A store charges a fixed delivery fee plus \$3 per item delivered. If the total cost for delivering 5 items is \$29, what is the delivery fee?

● Systems of Equations

2) A gym offers two membership plans:

- Plan A: \$20 sign-up fee + \$15 per month
- Plan B: \$5 sign-up fee + \$20 per month

After how many months will both plans cost the same?

● Functions (Interpretation)

3) A linear function f satisfies $f(2)=10$ and $f(6)=26$.

Which equation could represent $f(x)$?

● Problem Solving & Data Analysis — Percent Change

4) A laptop usually costs \$800, but during a sale the price drops to \$680.

What is the percent discount?



● Data Interpretation (Graph-Based)

5) A company tracks the number of online sales per day.

On Monday the company sold 120 units.

On Tuesday it sold 25% more than on Monday.

How many units were sold on Tuesday?

● Ratios & Proportions

6) A recipe uses flour and sugar in the ratio 5:2.

If a baker uses 750 grams of flour, how much sugar should be used?

● Algebra — Quadratic

7) The quadratic function $g(x)=x^2-8x+c$ has its vertex at $(4,-5)$.

What is the value of c ?

● Exponential Functions

8) A population of bacteria triples every 4 hours.

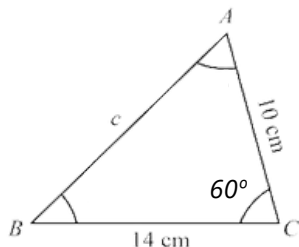
If the initial population is 200, which expression models the population after t hours?



■ Geometry — Triangle

9) In triangle ABC, sides a , b , and c satisfy $a=14$, $b=10$, and the angle between them is 60° .

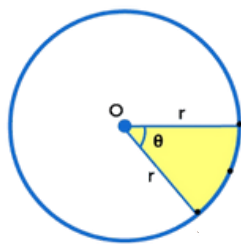
What is the approximate length of side c ?



■ Circle Geometry

10) A circle has radius 7 cm.

What is the area of a sector that represents 45° of the circle?



■ Trigonometry (Basic SAT)

11) A right triangle has hypotenuse 13 and one leg 5.

What is the length of the other leg?

■ Statistics — Weighted Average

12) A student's test scores are 70, 85, and 90.

The final test is worth twice as much as each previous test.

What is the student's weighted average score?

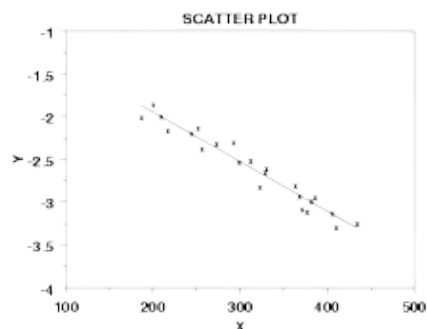


Correlation Reasoning

13) A scatterplot shows a strong negative linear relationship.

Which statement is most likely true?

- A) As x increases, y increases.
- B) As x increases, y decreases.
- C) y does not depend on x .
- D) There is no relationship at all.



Modeling — Real World

14) A streaming service charges \$12 per month plus \$2 per movie rented.

Which expression represents the total monthly cost for a customer who rents m movies?

Word Problem — Inequalities

15) A student needs at least 270 points to qualify for a scholarship.

Each assignment is worth 25 points and the student has already earned 145 points.

Which inequality shows how many more assignments x the student must complete?



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Blog: www.voceaprovado2005.com

A collage of four college-related images: a Gothic-style building with a tall spire, a brick building with a clock tower, a classical building with many columns, and a city street with purple banners.

ANSWER KEYS AND SOLUTIONS



1) Delivery fee

Answer: 14 dollars

Explanation:

Total cost = delivery fee + $3 \times$ (number of items).

So:

$$29 = \text{fee} + 3 \times 5$$

$$29 = \text{fee} + 15$$

$$\text{fee} = 29 - 15 = 14.$$

2) Gym plans

Answer: 3 months

Explanation:

$$\text{Plan A: } 20 + 15m$$

$$\text{Plan B: } 5 + 20m$$

Set them equal:

$$20 + 15m = 5 + 20m$$

$$20 - 5 = 20m - 15m$$

$$15 = 5m$$

$$m = 3.$$

3) Linear function $f(x)$

Answer: $f(x) = 4x + 2$

Explanation:

We have two points: (2, 10) and (6, 26).

$$\text{Slope: } m = (26 - 10) / (6 - 2) =$$

$$16 / 4 = 4.$$

$$\text{So } f(x) = 4x + b.$$

$$\text{Use } f(2) = 10:$$

$$10 = 4 \times 2 + b \rightarrow 10 = 8 + b$$

$$\rightarrow b = 2.$$

$$\text{Therefore } f(x) = 4x + 2.$$

4) Percent discount

Answer: 15%

Explanation:

$$\text{Discount} = 800 - 680 = 120.$$

$$\text{Percent discount} = 120 / 800 = 0.15 = 15\%.$$

5) Online sales on Tuesday

Answer: 150 units

Explanation:

“25% more” means multiply by 1.25.

$$\text{Tuesday sales} = 120 \times 1.25 =$$

$$120 \times (5/4) = 150.$$

6) Sugar in the recipe

Answer: 300 grams of sugar

Explanation:

$$\text{Flour : Sugar} = 5 : 2.$$

$$5 \text{ parts of flour} = 750 \text{ g} \rightarrow 1$$

$$\text{part} = 750 / 5 = 150 \text{ g.}$$

$$\text{Sugar} = 2 \text{ parts} = 2 \times 150$$

$$= 300 \text{ g.}$$



7) Value of c in $g(x)$

Answer: $c = 11$

Explanation:

$g(x) = x^2 - 8x + c$ has vertex $(4, -5)$.

For a quadratic $ax^2 + bx + c$, the x -coordinate of the vertex is $-b / (2a)$.

Here $a = 1$, $b = -8 \rightarrow x = -(-8) / (2 \times 1) = 8 / 2 = 4$ (consistent).

Now find y at $x = 4$:

$$g(4) = 4^2 - 8 \times 4 + c = 16 - 32 + c = -16 + c.$$

But the vertex y -value is -5 , so:

$$-16 + c = -5 \rightarrow$$

$$c = -5 + 16 = 11.$$

8) Bacteria population model

Answer: $P(t) = 200 \times 3^{(t/4)}$

Explanation:

Population starts at 200 and triples every 4 hours.

Number of 4-hour periods in t hours = $t / 4$.

Each period multiplies the population by 3, so:

$$P(t) = 200 \times 3^{(t/4)}.$$

9) Length of side c

Answer: $c \approx 12.5$

Explanation:

Use the Law of Cosines with $a = 14$, $b = 10$, angle $C = 60^\circ$.

$$c^2 = a^2 + b^2 - 2ab \cos(60^\circ)$$

$$c^2 = 14^2 + 10^2 - 2 \times 14 \times 10 \times 0.5$$

$$c^2 = 196 + 100 - 140 = 156$$

$$c = \sqrt{156} \approx 12.49 \approx 12.5.$$

10) Area of the sector (45°)

Answer: Area = $49\pi / 8 \text{ cm}^2 (\approx 19.2 \text{ cm}^2)$

Explanation:

$$\text{Area of a full circle: } A = \pi r^2 = \pi \times 7^2 = 49\pi.$$

A 45° sector is $45/360 = 1/8$ of the circle.

$$\text{Sector area} = (1/8) \times 49\pi =$$

$$49\pi / 8.$$

11) Other leg of the right triangle

Answer: 12

Explanation:

Let the unknown leg be x .

$$\text{By Pythagoras: } 5^2 + x^2 = 13^2$$

$$25 + x^2 = 169$$

$$x^2 = 169 - 25 = 144$$

$$x = \sqrt{144} = 12.$$



12) Weighted average score

Answer: 83.75

Explanation:

Scores: 70, 85, 90.

The final test (90) is worth twice as much as each previous test.

Weights: 70 (1), 85 (1), 90 (2).

Weighted average = $(70 + 85 + 2 \times 90) / (1 + 1 + 2)$

$= (70 + 85 + 180) / 4$

$= 335 / 4 = 83.75$

13) Correlation in the scatterplot

Answer: B) As x increases, y decreases.

Explanation:

A strong negative linear relationship means that when one variable increases, the other tends to decrease in a fairly consistent pattern.

So the correct description is: as x increases, y decreases.

14) Streaming service cost

Answer: $C(m) = 12 + 2m$

Explanation:

Fixed monthly fee: 12 dollars.

Variable cost: 2 dollars per movie, with m movies.

Total cost $C(m) = 12 + 2m$.

15) Inequality for the number of assignments

Answer: $145 + 25x \geq 270$

Explanation:

The student already has 145 points and earns 25 points per assignment.

Total points after x more assignments: $145 + 25x$.

To qualify, they need at least 270 points:

$145 + 25x \geq 270$.