

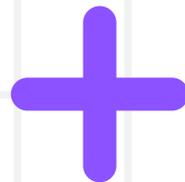
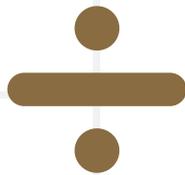


GRADE 8 ADVANCE

Math Booklet

(Modules 5, 6, and 7)

Math connects our community: we
measure, plan, share, and build a
better future together 



STUDENT'S NAME _____

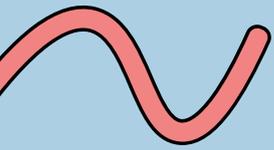
CLASS _____

Math Department

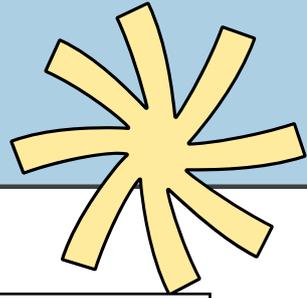
Ms. Rahila

School Principal

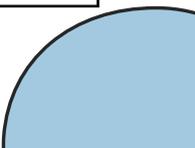
Dr. Alyazia ALDhaheri

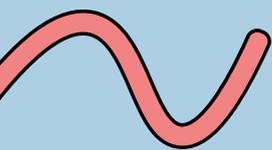


Mark Sheet



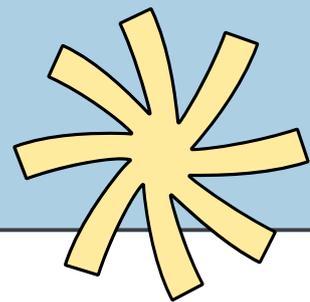
Lesson	Mark/Feedback





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Module 5 Lesson 1: Identify Functions

Lesson Objective: Determine whether a relation is a function using tables, mappings, and graphs.

Domain-Algebra

Work/Explain

1. A school ID system links each student ID to a locker number. Which situation would break the rule "ID \rightarrow locker" being a function?

- A. Two students share the same locker number
- B. One student is assigned two different locker numbers
- C. Many students are assigned locker numbers in one grade
- D. Some locker numbers are unused

2. A canteen app records (time of purchase \rightarrow total bill). Which makes this relation not a function?

- A. Two different times give the same total bill
- B. One time stamp appears twice with the same bill
- C. One time stamp has two different bills recorded
- D. Bills include decimals (e.g., 7.50 AED)

3. A bus card system stores (card number \rightarrow balance) at the moment you check. When is it definitely a function?

- A. If balances never repeat
- B. If each card number has exactly one balance at that moment
- C. If each balance belongs to exactly one card number
- D. If card numbers are consecutive

4. A science lab logs (beaker label \rightarrow temperature reading). Which log is a function?

- A. Beaker A: 40°C and 42°C at the same minute
- B. Beaker A: 40°C, Beaker B: 40°C
- C. Beaker A has no temperature reading at all
- D. Beaker A: 40°C and 42°C (no time given)

5. A delivery company records (package barcode \rightarrow destination city). Which statement is always true if this is a function?

- A. Two barcodes can't go to the same city
- B. Every city must appear once
- C. A barcode cannot map to two different cities
- D. Cities cannot repeat

Module 5 Lesson 1: Identify Functions

Lesson Objective: Determine whether a relation is a function using tables, mappings, and graphs.

Domain-Algebra

Work/Explain

6. A teacher records (student name \rightarrow quiz score). Which change makes it not a function?

- A. Two students score 8/10
- B. Same student appears twice with score 8/10 both times
- C. Same student appears with 8/10 and later 9/10 in the same list
- D. Some students score 0/10

7. Relation: x y : 1 4, 2 4, 3 6. Function?

- A. Yes
- B. No
- C. Only if graphed
- D. Only if y values are different

8. If input -2 maps to output 9, what is the output for -2?

- A. 9
- B. -9
- C. 2
- D. Cannot be determined

Quick Self-Check

- I can explain my answer using math vocabulary.
- I can show clear steps in the Work/Explain box.
- I can solve similar problems without help.

Teacher feedback:

Module 5 Lesson 2: Functions Tables

Lesson Objective: Interpret and complete function tables and determine whether a table represents a function.

Domain-Algebra

Work/Explain

1. A taxi fare is 12 AED base plus 3 AED per km. If x = km and y = total fare, which rule matches?

- A. $y = 12x + 3$
- B. $y = 3x + 12$
- C. $y = 12 - 3x$
- D. $y = 3(x - 12)$

2. A phone plan charges 25 AED plus 0.5 AED per minute. Which table row must be true?

- A. If $x=10$, $y=30$
- B. If $x=10$, $y=25.5$
- C. If $x=10$, $y=50$
- D. If $x=10$, $y=27.5$

3. A factory makes a profit of 80 AED for every item, but has a start-up cost of 500 AED. If x = items sold and y = profit (AED), which is correct?

- A. $y = 500x - 80$
- B. $y = 80x + 500$
- C. $y = 80x - 500$
- D. $y = 500 - 80x$

4. A gym membership: y is total cost after x months. From a table you notice: every time x increases by 1, y increases by 15. What is the rate of change?

- A. 15 AED per month
- B. 1/15 month per AED
- C. 15 months per AED
- D. Depends on starting cost only

5. A function is defined by $f(x) = 4x - 9$. A student claims " $f(2) = -1$ ". What is the best conclusion?

- A. Correct, because $4(2) - 9 = -1$
- B. Incorrect, because $f(2)$ must be positive
- C. Incorrect, because $4(2) - 9 = 1$
- D. Cannot decide without a table

Module 5 Lesson 2: Functions Tables

Lesson Objective: Interpret and complete function tables and determine whether a table represents a function.

Domain-Algebra

6. If the rule is $y = 2x + 1$, what is y when $x=4$?

- A) 7 B) 8 C) 9 D) 10

7. In a function table, the input is usually...

- A) x
B) y
C) both x and y
D) neither

3. Complete the table for $y=3x$: $x=5$ $y=?$

- A) 8. B) 12 C) 15 D) 18

4. Which rule matches the table $x:0,1,2$ $y:5,7,9$?

- A) $y=2x+5$
B) $y=5x+2$
C) $y=x+5$
D) $y=3x+5$

5. If a table has $x:2,2,3$ and $y:4,5,6$, is it a function?

- A) Yes
B) No
C) Sometimes
D) Only if graphed

Quick Self-Check

- I can explain my answer using math vocabulary.
 I can show clear steps in the Work/Explain box.
 I can solve similar problems without help.

Teacher feedback:

Work/Explain

Module 5 Lesson 3: Construct Linear Functions

Lesson Objective: Write a linear function rule from tables, patterns, and real situations.

1. A printing shop charges a setup fee plus 2 AED per page. A job of 10 pages costs 35 AED. What is the equation $y = ?$
 - A. $y = 2x + 15$
 - B. $y = 15x + 2$
 - C. $y = 35x - 10$
 - D. $y = 2x + 35$
2. A school fundraiser sells wristbands. At 20 wristbands, revenue is 300 AED; at 30 wristbands, revenue is 450 AED. Assuming linear, what is price per wristband?
 - A. 10 AED
 - B. 12 AED
 - C. 15 AED
 - D. 20 AED
3. A car rental charges 80 AED plus 0.6 AED per km. A customer paid 200 AED. How many km did they drive?
 - A. 120 km
 - B. 150 km
 - C. 200 km
 - D. 280 km
4. A student saves money weekly. After 4 weeks she has 260 AED; after 10 weeks she has 500 AED. If linear, what is her weekly saving rate?
 - A. 30 AED/week
 - B. 40 AED/week
 - C. 50 AED/week
 - D. 60 AED/week
5. A line passes through two points that represent a situation: $(x,y) = (2, 9)$ and $(6, 21)$. Which equation fits?
 - A. $y = 3x + 3$
 - B. $y = 2x + 5$
 - C. $y = 4x + 1$
 - D. $y = 6x - 3$
6. A courier's delivery fee is linear. It is 25 AED for 3 km and 37 AED for 7 km. What is the base fee (y -intercept)?
 - A. 12 AED
 - B. 16 AED
 - C. 19 AED
 - D. 22 AED

Domain-Algebra

Work/Explain

Module 5 Lesson 3: Construct Linear Functions

Lesson Objective: Write a linear function rule from tables, patterns, and real situations.

Domain-Algebra

Work/Explain

6. If y increases 6 when x increases 2, slope is...

- A) 3
- B) 12
- C) -3
- D) $\frac{1}{3}$

7. If $f(x) = 5x - 2$, find $f(0)$.

- A) -2
- B) 0
- C) 2
- D) 5

8. If $f(x) = x + 4$, which pair is on the graph?

- A) (2, 6)
- B) (2, 4)
- C) (6, 2)
- D) (4, 2)

Teacher feedback:

Quick Self-Check

- I can explain my answer using math vocabulary.
- I can show clear steps in the Work/Explain box.
- I can solve similar problems without help.

Module 5 Lesson 4: Compare Functions

Lesson Objective: Compare linear functions shown as equations, tables, graphs, and verbal descriptions.

1. Plan A: $y = 8x + 20$ (AED). Plan B: $y = 6x + 35$. For what x do they cost the same?

- A. $x = 5$
- B. $x = 7.5$
- C. $x = 10$
- D. $x = 15$

2. Two taxis:

Taxi X: base 10 AED + 4 AED per km

Taxi Y: base 18 AED + 3 AED per km

For a long trip, which is cheaper and why?

- A. X, because it has higher base fee
- B. X, because it has lower rate per km
- C. Y, because it has lower rate per km
- D. Y, because it has higher base fee

3. Function P is given by a table showing +5 in y for each +1 in x . Function Q is $y = 4x + 12$. Which grows faster?

- A. P
- B. Q
- C. Same growth
- D. Cannot compare

4. A student claims: "If two linear functions have the same slope, one must be better (bigger) for all x ." Which is true?

- A. True always
- B. False: if slopes same, they differ by a constant and one stays bigger for all x (unless equal)
- C. False: they cross infinitely many times
- D. True only if intercept is zero

5. Two payment options for gym classes:

Option 1: 50 AED membership + 15 AED/class

Option 2: 0 AED membership + 20 AED/class

When does Option 1 become cheaper?

- A. After 5 classes
- B. After more than 10 classes
- C. After exactly 10 classes
- D. Never

Domain-Algebra

Work/Explain

Module 5 Lesson 4: Compare Functions

Lesson Objective: Compare linear functions shown as equations, tables, graphs, and verbal descriptions.

Domain-Algebra

Work/Explain

6. Two lines represent temperature changes (in °C) over time t . Line A is steeper upward than line B. What must be true?

- A. A has smaller rate of change
- B. A has larger rate of change
- C. A has smaller intercept
- D. A reaches zero first

7. A situation: 50 AED fixed fee + 8 per hour. Slope is...

- A) 50
- B) 8
- C) 58
- D) -8

8. Which function grows faster? $y=4x+1$ or $y=2x+10$

- A) $y=4x+1$
- B) $y=2x+10$
- C) same
- D) depends on x only

Teacher feedback:

Quick Self-Check

- I can explain my answer using math vocabulary.
- I can show clear steps in the Work/Explain box.
- I can solve similar problems without help.

Module 5 Lesson 5: Nonlinear Functions

Lesson Objective: Identify nonlinear functions and describe how their graphs change.

Domain-Algebra

Work/Explain

1. Which is nonlinear?

- A) $y=2x+1$
- B) $y=x^2$
- C) $y=-3x$
- D) $y=0.5x$

2. A nonlinear graph often has...

- A) a curve
- B) constant slope
- C) no intercept
- D) no points

3. Table x:1,2,3 y:1,4,9 matches...

- A) $y=x^2$
- B) $y=2x$
- C) $y=x+2$
- D) $y=3x$

4. Which has changing rate of change?

- A) parabola
- B) line
- C) horizontal line
- D) vertical line

5. If a function is linear, its graph is...

- A) a straight
- B) a circle
- C) a curve
- D) a triangle

Module 5 Lesson 5: Nonlinear Functions

Lesson Objective: Identify nonlinear functions and describe how their graphs change.

Domain - Functions

Work/Explain

6. A bacteria culture doubles every hour. If x = hours, y = population, which model matches best?

- A. $y = 2x$
- B. $y = x^2$
- C. $y = 2^x$
- D. $y = x + 2$

7. A square courtyard has side length x meters and area y m². Which is true?

- A. y increases by a constant amount each time x increases by 1
- B. $y = x^2$ and is non-linear
- C. $y = 4x$ and is linear
- D. y must be a function only for $x < 10$

8. A ball is thrown upward. Height depends on time and forms a curve that goes up then down. Which statement is correct?

- A. It must be linear because time increases evenly
- B. It is non-linear and can still be a function
- C. It is not a function because height repeats
- D. It is always exponential

9. A discount reduces a price by 10% each week. If x = weeks, y = price, then y changes by:

- A. subtracting 10 each week
- B. subtracting the same amount each week
- C. multiplying by 0.9 each week
- D. adding 0.9 each week

10. A table has x : 0,1,2,3 and y : 1,2,4,8. Which description fits?

- A. Linear growth of +2
- B. Exponential growth
- C. Quadratic growth
- D. Not a function

Teacher feedback:

Quick Self-Check

- I can explain my answer using math vocabulary.
- I can show clear steps in the Work/Explain box.
- I can solve similar problems without help.

Module 5 Lesson 6: Qualitative Functions

Lesson Objective: Use a qualitative graph to describe how quantities change over time.

1. On a qualitative graph, an increasing line means...

- A) quantity rises over time
- B) quantity stays same
- C) time decreases
- D) quantity is zero

2. A horizontal segment shows...

- A) constant value
- B) increasing fast
- C) decreasing
- D) undefined

3. A steep upward segment means...

- A) increasing quickly
- B) increasing slowly
- C) decreasing quickly
- D) constant

4. If distance-time graph slopes downward, the object is...

- A) returning closer
- B) stopped
- C) speeding up
- D) at constant distance

5. Which describes 'steady speed'?

- A) straight rising line
- B) curved line
- C) vertical line
- D) zigzag

Domain - Functions

Work/Explain

Module 5 Lesson 6: Qualitative Functions

Lesson Objective: Use a qualitative graph to describe how quantities change over time.

Domain - Functions

6. A distance–time graph rises steeply, then becomes horizontal. Best interpretation:

- A. Starts slow then speeds up
- B. Moves away quickly then stops
- C. Returns back to start
- D. Keeps moving at constant speed

7. A temperature–time graph decreases, reaches a lowest point, then increases. The lowest point represents:

- A. Maximum temperature
- B. Minimum temperature
- C. y-intercept
- D. Constant rate of change

8. A line on a cost–items graph has y-intercept 40. What does 40 represent?

- A. Cost per item
- B. Items you can buy for free
- C. Fixed starting cost before buying items
- D. Total cost after 40 items

9. Two students' savings graphs start at different y-intercepts but have the same slope. What is true?

- A. They save at different weekly rates
- B. They save at the same weekly rate but started with different amounts
- C. One will eventually overtake the other for sure
- D. Their graphs must cross

10. A graph of profit vs. items sold crosses the x-axis at $x = 50$. Meaning:

- A. At 50 items, profit is highest
- B. At 50 items, profit is zero (break-even)
- C. At 50 items, cost is zero
- D. At 50 items, profit is negative maximum

Work/Explain

Quick Self-Check

- I can explain my answer using math vocabulary.
- I can show clear steps in the Work/Explain box.
- I can solve similar problems without help.

Module 6 Lesson 1: Solve Systems by Graphing

Lesson Objective: Solve a system of linear equations by graphing and interpret the solution.

1. Ticket Sales (intersection = exact counts)

A theater sells adult tickets (30 AED) and student tickets (18 AED). A total of 20 tickets were sold for 456 AED. How many adult tickets were sold?

- A. 6 B. 8 C. 10 D. 12

2. Phone Plans (intersection point)

Plan A costs 50 AED + 0.10 AED per MB. Plan B costs 20 AED + 0.20 AED per MB. At what data usage do the plans cost the same?

- A. 150 MB B. 200 MB C. 300 MB D. 400 MB

3. Two Runners (same distance, same time)

Runner A's distance is $d=7t+2$ km. Runner B's distance is $d=9t-4$ km. When do they have the same distance?

- A. $t=2$ B. $t=3$ C. $t=4$ D. $t=6$

4. Identify the Correct System (modeling)

A taxi charges a fixed fee of 12 AED plus 3 AED per km. Another taxi charges 20 AED plus 2 AED per km. Which system models the total cost y for x km?

- A. $y=3x+12$, $y=2x+20$
B. $y=12x+3$, $y=20x+2$
C. $y=3x-12$, $y=2x-20$
D. $y=12-3x$, $y=20-2$

5. Meaning of the Intersection (interpretation)

Two cost graphs intersect at (10,80) where x is km and y is AED. What does (10,80) mean?

- A. At 80 km, the cost is 10 AED
B. At 10 km, the cost is 80 AED for both taxis
C. One taxi costs 10 AED more than the other
D. The taxis are never the same price

Work/Explain

Module 6 Lesson 1: Solve Systems by Graphing

Lesson Objective: Solve a system of linear equations by graphing and interpret the solution.

Domain-Expressions and equations

6. Check a "solution" quickly (graphing idea)

A student claims $(4, 11)$ is the solution to the system $y = 2x + 3$ and $y = 3x - 1$. What is correct?

- A. True, it satisfies both equations
- B. False, it satisfies neither equation
- C. False, it satisfies only $y = 2x + 3$
- D. False, it satisfies only $y = 3x - 1$

7. Solution of a system by graphing is...

- A) intersection point
- B) y-intercept
- C) slope
- D) x-intercept

8. If lines intersect once, system has...

- A) one solution
- B) no solution
- C) infinitely many
- D) two solutions

9. Solve: $y = x + 2$ and $y = -x + 4$. Intersection?

- A) (1, 3)
- B) (2, 2)
- C) (3, 1)
- D) (0, 2)

10. Which is a system of equations?

- A) $y = 2x + 1$ and $y = 3x - 5$
- B) $y = 2x + 1$
- C) $2x + 1$
- D) $x = 0$

Work/Explain

Module 6 Lesson 2: Determine Number of Solutions

Lesson Objective: Determine whether a system has one solution, no solution, or infinitely many.

Domain-Expressions and equations

1. Same slope, different intercept \Rightarrow

- A) no solution
- B) one solution
- C) infinite
- D) two

2. Same equation (equivalent lines) \Rightarrow

- A) infinitely many solutions
- B) no solution
- C) one solution
- D) zero

3. $y=2x+1$ and $y=2x-3$ have...

- A) no solution
- B) one
- C) infinite
- D) two

4. $2y=4x+6$ and $y=2x+3$ have...

- A) infinitely many
- B) no
- C) one
- D) two

5. Parallel lines mean...

- A) never meet
- B) meet once
- C) same line
- D) curved

Work/Explain

Module 6 Lesson 2: Determine Number of Solutions

Lesson Objective: Determine whether a system has one solution, no solution, or infinitely many.

1. Parallel Pricing (no solution)

Taxi A: 12 AED + 4 AED/km. Taxi B: 18 AED + 4 AED/km. How many km makes the costs equal?

- A. Exactly 6 km
- B. Exactly 3 km
- C. Infinitely many km values
- D. No km value (no solution)

2. Same Deal, Different Words (infinitely many solutions)

Shop A: "5 AED joining fee + 2 AED per class."

Shop B: "Total cost y after x classes is

$$y=2x+5y = 2x + 5y=2x+5."$$

Number of solutions when comparing the two costs:

- A. 0
- B. 1
- C. Infinitely many
- D. Cannot be determined

3. Different Rates (one solution)

Plan A: $y=2x+30$. Plan B: $y=3x+10$. How many solutions does the system have?

- A. 0
- B. 1
- C. 2
- D. Infinitely many

4. Decide Without Solving (structure check)

Two companies have cost models: $y=6x+15$ and $y=6x-4$

The system has:

- A. 0 solutions
- B. 1 solution
- C. 2 solutions
- D. Infinitely many solutions

5. Which condition gives infinitely many solutions?

- A. Same slope, different intercept
- B. Different slope, same intercept
- C. Same slope and same intercept
- D. One line is vertical

Work/Explain

Quick Self-Check

- I can explain my answer using math vocabulary.
- I can show clear steps in the Work/Explain box.
- I can solve similar problems without help.

Module 6 Lesson 3: Solve Systems by Substitution

Lesson Objective: Solve systems of equations using substitution.

1. Geometry (perimeter + expression)

A rectangle has perimeter 54 cm. Its length is 3 more than twice its width. What is the width?

- A. 8 B. 9 C. 10 D. 11

2. Number Relationship

Two numbers add to 50. One number is 6 less than three times the other. What is the larger number?

- A. 32 B. 34 C. 36 D. 38

3. Two Rides (solve for meeting time)

Ride A costs 4 AED + 2 AED per minute. Ride B costs 1 AED + 3 AED per minute. After how many minutes are the costs equal?

- A. 2 B. 3 C. 4 D. 5

4. Shopping by Weight (system from words)

Apples cost 6 AED/kg and oranges cost 4 AED/kg. A customer buys 11 kg total for 52 AED. How many kg of apples?

- A. 3 B. 4 C. 5 D. 7

5. Supplementary Angles (advanced modeling)

Two supplementary angles sum to 180° . One angle is 6 more than twice the other. What is the larger angle?

- A. 118° B. 120° C. 122° D. 124°

Work/Explain

Quick Self-Check

- I can explain my answer using math vocabulary.
- I can show clear steps in the Work/Explain box.
- I can solve similar problems without help.

Module 6 Lesson 3: Solve Systems by Substitution

Lesson Objective: Solve systems of equations using substitution.

6. Solve by substitution: $y=2x$ and $x+y=9$. $x=?$

- A) 3
- B) 4
- C) 5
- D) 6

7. In substitution, first step is...

- A) solve one equation for a variable
- B) add equations
- C) graph
- D) multiply both

8. Solve: $y=x+1$ and $2x+y=10$. $y=?$

- A) 3
- B) 4
- C) 5
- D) 6

9. After substitution, you get a(n)...

- A) one-variable equation
- B) system
- C) graph
- D) inequality

10. Solve: $y=3$ and $x-y=2 \Rightarrow x=?$

- A) 1
- B) 5
- C) -1
- D) 2

Work/Explain

Module 6 Lesson 4: Solve Systems by Elimination

Lesson Objective: Solve systems using elimination (addition/subtraction)

1. Elimination works by
- A) adding/subtracting equations
 - B) graphing
 - C) multiplying only
 - D) guessing

2. Solve: $x+y=8$ and $x-y=2$. $x=?$
- A) 3
 - B) 5
 - C) 6
 - D) 10

3. To eliminate y , you can...
- A) make coefficients opposites
 - B) change intercept
 - C) draw graph
 - D) divide by 0

4. Solve: $2x+y=11$ and $2x-y=5$. $y=?$
- A) 3
 - B) 6
 - C) 8
 - D) 16

5. If adding gives $0=7$, system has...
- A) no solution
 - B) one solution
 - C) infinite
 - D) depends

Work/Explain

Module 6 Lesson 4: Solve Systems by Elimination

Lesson Objective: Solve systems using elimination (addition/subtraction)

6. Meal Deal (clean elimination)

2 sandwiches + 3 juices cost 31 AED.

4 sandwiches + 1 juice cost 37 AED.

What is the price of one sandwich?

- A. 7 B. 8 C. 9 D. 10

7. Coins (value + count)

A jar has 26 coins made of 5-AED coins and 1-AED coins worth 74 AED in total. How many 5-AED coins?

- A. 10 B. 11 C. 12 D. 14

8. Stationery (requires scaling)

3 notebooks and 2 pens cost 34 AED.

5 notebooks and 4 pens cost 58 AED.

What is the price of one pen?

- A. 1 AED. B. 2 AED C. 3 AED D. 4 AED

9. Mixture Cost (algebra + elimination idea)

Almonds cost 28 AED/kg and cashews cost 40 AED/kg. A mix is 6 kg and costs 192 AED. How many kg of cashews?

- A. 1 B. 2 C. 3 D. 4

10. River Current (classic elimination)

A boat travels 45 km downstream in 3 hours and 45 km upstream in 5 hours. What is the speed of the current (km/h)?

- A. 2 B. 3 C. 4 D. 6

11. Ages (system from relationships)

A father and son together are 55 years old. The father is 4 times the son's age. How old is the son?

- A. 10 B. 11 C. 12 D. 13

Work/Explain

Module 6 Lesson 5: Write and Solve system of equations

Lesson Objective: Write a system from word problems and solve it.

1) School Supplies (write a system + solve)

A student buys 2 packs of pencils and 5 folders for 57 AED.

Another student buys 1 pack of pencils and 4 folders for 42.25 AED.

What is the cost of one folder?

- A. 6.25 AED
- B. 7.25 AED
- C. 8.25 AED
- D. 9.25 AED

2) Two Numbers (sum & difference)

The sum of two numbers is 39 and their difference is 7 (larger – smaller).

What are the two numbers?

- A. (20, 19)
- B. (23, 16)
- C. (26, 13)
- D. (28, 11)

3) Scrabbooking Lessons (break-even with fixed fee + hourly rate)

Store A charges 15 AED per hour + 10 AED materials.

Store B charges 20 AED per hour with no extra fee.

For how many hours will the total cost be the same?

- A. 1 hour
- B. 2 hours
- C. 3 hours
- D. 4 hours

4) Donation Items (total + “times as many”)

A charity receives 75 items of two types: loaves of banana bread and bags of popcorn.

There are 4 times as many bags of popcorn as loaves of banana bread.

How many loaves of banana bread were donated?

- A. 12
- B. 15
- C. 18
- D. 20

Work/Explain

Module 6 Lesson 5: Write and Solve system of equations

Lesson Objective: Write a system from word problems and solve it.

5) Vehicles in Stock (wheels + total vehicles)

A store has 45 vehicles in stock made up of motorcycles (2 wheels) and ATVs (4 wheels). Altogether there are 130 wheels.

How many ATVs are there?

- A. 15
- B. 18
- C. 20
- D. 25

6) Concession Stand (system given; find unit price)

At a concession stand, 84 hot dogs and 36 hamburgers cost 276 AED.

Also, 18 hot dogs and 60 hamburgers cost 174 AED.

What is the cost of one hot dog?

- A. 1.50 AED
- B. 2.00 AED
- C. 2.50 AED
- D. 3.00 AED

7. System: $x+y=10$ and $x=6$. $y=$

- A) 4 B) 6 C) 10 D) 16

Work/Explain

Module 7 Lesson 1: Angle Relationships & Parallel Lines

Lesson Objective: Use angle relationships formed by parallel lines and a transversal.

1. Two parallel railway tracks are cut by a service road (a transversal). At one crossing, a corresponding angle is $(4x+18)$ and its corresponding angle at the second track is $(7x-9)$. What is the measure of each corresponding angle?

- A. 45° B. 63° C. 78° D. 99°

2. A glass façade has two parallel metal beams. A diagonal support bar forms an angle of 112° with the top beam (an interior angle). What is the measure of the alternate interior angle at the bottom beam?

- A. 68° B. 112° C. 180° D. 56°

3. A bridge design uses two parallel cables. The angle between a transversal brace and one cable is x° . The supplementary angle next to it is $(3x-20)$. Find x .

- A. 40 B. 50 C. 60 D. 70

4. In a road map, two parallel streets are crossed by a diagonal alley. One exterior angle is 135° . What is the measure of the alternate exterior angle?

- A. 45° B. 135° C. 90° D. 180°

5. An architect marks two parallel lines on a plan. At the first intersection, an angle is $5x^\circ$. At the second intersection, the vertical angle to the corresponding angle is $(2x+54)^\circ$. Find x .

- A. 12 B. 18 C. 24 D. 30

6. In a staircase railing, two parallel bars are cut by a diagonal rod. One acute angle is 37° . How many distinct angle measures appear among the 8 angles formed?

- A. 1 B. 2 C. 4 D. 8

Work/Explain

Module 7 Lesson 1: Angle Relationships & Parallel Lines

Lesson Objective: Use angle relationships formed by parallel lines and a transversal.

7.If corresponding angles are equal, lines are...

- A) parallel
- B) perpendicular
- C) skew
- D) curved

8.If alternate exterior angles are 110° , the other is...

- A) 110°
- B) 70°
- C) 90° D) 180°

8.Supplementary angles sum to...

- A) 180° B) 360° C) 90° D) 0°

Work/Explain

Module 7 Lesson 2: Angle Relationships & Triangles

Lesson Objective: Find unknown angles in triangles and use special triangle facts.

Domain-Geometry

Work/Explain

1. Sum of angles in a triangle is...

- A) 180°
- B) 360°
- C) 90°
- D) 270°

2. If triangle has angles 50° and 60° , third angle is...

- A) 70°
- B) 80°
- C) 90°
- D) 110°

3. Exterior angle equals...

- A) sum of two remote interior angles
- B) one interior angle
- C) 180° always
- D) 0

4. Isosceles triangle has...

- A) two equal sides
- B) three equal sides
- C) no equal sides
- D) right angles only

5. If base angles of isosceles triangle are 40° each, vertex angle is...

- A) 100°
- B) 80°
- C) 40°
- D) 140°

Module 7 Lesson 2: Angle Relationships & Triangles

Lesson Objective: Find unknown angles in triangles and use special triangle facts.

Domain-Expressions and equations

Work/Explain

6. A roof truss forms a triangle. Two interior angles are 48° and 67° . What is the third interior angle?
- A. 55°
B. 65°
C. 75°
D. 85°
7. At a park sign, a triangular support has an exterior angle of 124° at one vertex. One of the remote interior angles is 51° . What is the other remote interior angle?
- A. 49 degree
B. 63 degree
C. 73 degree
D. 83 degree
8. A surveyor measures a triangle plot. The exterior angle at vertex A is $(6x+10)^\circ$. The two remote interior angles are $(3x)^\circ$ and $(2x+20)^\circ$. Find the exterior angle measure.
- A. 110° B. 120° C. 130° D. 140°
9. In a triangular warning sign, the angles are in the ratio 2:3:4. What is the largest angle?
- A. 60° B. 70° C. 80° D. 90°
10. A designer needs a triangle where one angle is twice another. If the smallest angle is 35° and the third angle is 75° , is the "twice" condition satisfied?
- A. Yes, because $70=2(35)$
B. Yes, because $75=2(35)+5$
C. No, because the remaining angle is 70° , not 75°
D. No, because triangles cannot have a 75° angle
11. A kite frame forms an isosceles triangle with vertex angle 40° . What is each base angle?
- A. 20°
B. 60°
C. 80°
D. 70 degree

Module 7 Lesson 3:

Use the Pythagorean Theorem to find missing side lengths in right triangles.

Domain-Expressions and equations

1. In a right triangle with legs 3 and 4, hypotenuse is...

- A) 5
- B) 6
- C) 7
- D) 8

2. Pythagorean Theorem is...

- A) $a^2 + b^2 = c^2$
- B) $a + b = c$
- C) $2a + 2b = c$
- D) $ab = c$

3. If $c = 13$ and $a = 5$, $b = ?$

- A) 12
- B) 8
- C) 18
- D) 10

4. Which triangle is right?

- A) 6, 8, 10
- B) 5, 5, 5
- C) 7, 8, 9
- D) 4, 5, 6

5. If legs are 9 and 12, $c = ?$

- A) 15
- B) 21
- C) 18
- D) 3

Work/Explain

Module 7 Lesson 3:

Use the Pythagorean Theorem to find missing side lengths in right triangles.

1. A wheelchair ramp rises 1.2 m vertically over a horizontal run of 4.5 m. About how long is the ramp (nearest tenth)?

- A. 4.6 m
- B. 4.7 m
- C. 4.8 m
- D. 4.9 m

2. A drone flies 13 km straight while moving 5 km east. Assuming a right triangle, how far north did it travel?

- A. 8 km
- B. 10 km
- C. 12 km
- D. 18 km

3. A TV screen is 48 cm wide and 36 cm tall. What is the diagonal length?

- A. 60 cm
- B. 72 cm
- C. 84 cm
- D. 96 cm

4. A ladder reaches a window 15 ft high. The base is 8 ft from the wall. What is the ladder length?

- A. 17 ft
- B. 19 ft
- C. 21 ft
- D. 23 ft

5. A rectangular garden is 9 m by 12 m. A sprinkler hose goes diagonally from one corner to the opposite. Hose length is:

- A. 13 m B. 14 m C. 15 m D. 16 m

6. Advanced (3D): A 10 m pole stands in the center of a square platform. Each corner is 6 m from the pole's base (on the ground). A cable goes from the top of the pole to a corner. Cable length (nearest tenth) is:

- A. 11.7 m B. 12.2 m C. 13.4 m D. 16.0 m

Domain-Geometry

Work/Explain

Module 7 Lesson 4: Converse of Pythagorean Theorem

Lesson Objective: Determine whether a triangle is right using the converse of the Pythagorean Theorem.

Domain-Geometry

1. Converse: If $a^2 + b^2 = c^2$, then the triangle is...

- A) right
- B) acute
- C) obtuse
- D) equilateral

2. Sides 8, 15, 17 form a...

- A) right triangle
- B) acute
- C) obtuse
- D) isosceles

3. If $a^2 + b^2 > c^2$, triangle is...

- A) acute B) right C) obtuse D) flat

4. If $a^2 + b^2 < c^2$, triangle is...

- A) obtuse
- B) acute
- C) right
- D) equilateral

5. Sides 9, 12, 16 is...

- A) obtuse
- B) right
- C) acute
- D) equilateral

Work/Explain

Module 7 Lesson 4: Converse of Pythagorean Theorem

Lesson Objective: Determine whether a triangle is right using the converse of the Pythagorean Theorem.

Domain-Geometry

Work/Explain

1. A contractor measures a triangular brace with side lengths 9 m, 12 m, and 15 m. Is it a right triangle?

A. Yes B. No C. Not enough information D.

Only if the largest side is 12 m

2. A sports coach marks a triangle with sides 7 m, 24 m, and 25 m. This triangle is:

A. Acute B. Right C. Obtuse D. Equilateral

3. A triangular sign has sides 10 cm, 10 cm, and 14 cm. Is it a right triangle?

A. Yes B. No C. Only if rotated D. Only if it is isosceles

4. A survey triangle has sides 8, 15, 16 (same units). Classify the triangle.

A. Right B. Acute C. Obtuse D. Equilateral

5. A rectangular patio corner is tested using 5 m and 12 m along the edges. The diagonal measured is 13 m. What conclusion is correct?

A. Corner is not 90°

B. Corner is 90°

C. Diagonal should be 12 m

D. Need area to decide

Module 7 Lesson 5: Distance on the Coordinate Plane

Lesson Objective: Find distance between two points using the distance formula (Pythagorean).

Domain-Geometry

Work/Explain

1.Distance between (0,0) and (3,4) is...

- A) 5 B) 7 C) 1 D) 12

2.Distance formula comes from...

- A) Pythagorean Theorem
B) vertical line test
C) area
D) slope

3.Distance between (1,2) and (4,6) is...

- A) 5 B) 4 C) 3 D) 6

4.If points have same x-coordinate, distance is...

- A) difference of y-values
B) difference of x-values
C) sum of x
D) 0 always

5.Distance between (-2,1) and (1,1) is...

- A) 3 B) -3 C) 1 D) 0

Module 7 Lesson 5: Distance on the Coordinate Plane

Lesson Objective: Find distance between two points using the distance formula (Pythagorean).

Domain-Geometry

Work/Explain

