Math Master Worksheet

Algebra 1 (Q1–10) + Geometry (Q11–20) · Most Commonly Missed Topics

Name: _____ Date: _____ Score: _____ / 20

===== ■ ALGEBRA 1 ==========

Q1 · Solving Linear Equations

Multi-Step Linear Equations

A linear equation has the form ax + b = c. Isolate the variable by performing the same operation on both sides.

Example: Solve 2x + 5 = 13 → Step 1: subtract 5 → 2x = 8 | Step 2: divide by 2 → x = 4

① Step 1 of 3

Step 1: Solve for x: 3x - 7 = 14

(A) A. x = 3
(B) B. x = 7
(C) C. x = 21/3
(D) D. x = 2 1/3

My work / thinking:

My Answer: _____ Correct Answer: B Explanation: 3x - 7 = 14 → 3x = 21 → x = 7

② Step 2 of 3

Step 2: Solve for x: 5x + 3 = 3x + 11

(A) A. x = 3
(B) B. x = 4
(C) C. x = 7
(D) D. x = 2

My work / thinking:

My Answer: _____ Correct Answer: B Explanation: 5x - 3x = 11 - 3 → 2x = 8 → x = 4

③ Step 3 of 3

Step 3: Solve for x: 2(x + 4) = 3x - 1

(A) A. x = 9
(B) B. x = 7

(C) C. x = -9
(D) D. x = 11

My work / thinking:

My Answer: _____ Correct Answer: A Explanation: 2x + 8 = 3x - 1 → 9 = x

Extra Work Space:

Q2 · Slope & Linear Functions

Slope-Intercept Form y = mx + b

y = mx + b : m = slope (rise/run), b = y-intercept. Point-slope form: y - y1 = m(x - x1)

Example: Slope between (1,5) and (3,9): m = (9-5)/(3-1) = 4/2 = 2

① Step 1 of 3

Step 1: What is the slope of the line through (2, 5) and (6, 13)?

(A) A. m = 1
(B) B. m = 2
(C) C. m = 3
(D) D. m = 4

My work / thinking:

My Answer: _____ Correct Answer: B Explanation: m = (13-5)/(6-2) = 8/4 = 2

② Step 2 of 3

Step 2: Which equation has slope = -3 and passes through (0, 4)?

(A) A. y = 3x + 4
(B) B. y = -3x - 4
(C) C. y = -3x + 4
(D) D. y = 4x - 3

My work / thinking:

My Answer: _____ Correct Answer: C Explanation: y-intercept = 4 and slope = -3 → y = -3x + 4

③ Step 3 of 3

Step 3: Find the equation of a line with slope 2 through (1, 7).

(A) A. y = 2x + 5
(B) B. y = 2x + 9
(C) C. y = 2x + 7
(D) D. y = 7x + 2

My work / thinking:

My Answer: _____ Correct Answer: A Explanation: y - 7 = 2(x - 1) → y = 2x + 5

Extra Work Space:

Q3 · Systems of Equations

Solving Systems of Linear Equations

Use substitution or elimination to solve. If lines are identical: infinitely many solutions. If parallel: no solution.

Example: Substitution: y = 2x, x + y = 9 → x + 2x = 9 → x = 3, y = 6

① Step 1 of 3

Step 1: Solve: x + y = 10 and x - y = 2

(A) A. (3, 7)
(B) B. (6, 4)
(C) C. (4, 6)
(D) D. (5, 5)

My work / thinking:

My Answer: _____ Correct Answer: B Explanation: Add equations: 2x = 12 → x = 6; subtract: 2y = 8 → y = 4

② Step 2 of 3

Step 2: Solve by substitution: y = 3x - 1 and 2x + y = 9

(A) A. (2, 5)
(B) B. (1, 7)
(C) C. (3, 3)
(D) D. (-1, -4)

My work / thinking:

My Answer: _____ Correct Answer: A Explanation: 2x + (3x-1) = 9 → 5x = 10 → x = 2, y = 5

③ Step 3 of 3

Step 3: How many solutions does y = 2x + 1 and 2y = 4x + 2 have?

(A) A. No solution
(B) B. Exactly one
(C) C. Infinitely many
(D) D. Exactly two

My work / thinking:

My Answer: _____ Correct Answer: C Explanation: 2y = 4x+2 simplifies to y = 2x+1 — the SAME line → infinite solutions

Extra Work Space:

Q4 · Factoring Polynomials

Factoring Quadratic Expressions

For x^2 + bx + c, find two numbers that multiply to c and add to b. Always factor out GCF first!

Example: x^2 + 5x + 6 = (x + 2)(x + 3) because 2 x 3 = 6 and 2 + 3 = 5

① Step 1 of 3

Step 1: Factor: x^2 + 7x + 12

(A) A. (x+3)(x+4)
(B) B. (x+2)(x+6)
(C) C. (x+1)(x+12)
(D) D. (x+3)(x+9)

My work / thinking:

My Answer: _____ Correct Answer: A Explanation: 3 x 4 = 12 and 3 + 4 = 7 → (x+3)(x+4)

② Step 2 of 3

Step 2: Factor: x^2 - 5x + 6

(A) A. (x-2)(x-3)
(B) B. (x+2)(x-3)
(C) C. (x-1)(x-6)
(D) D. (x-2)(x+3)

My work / thinking:

My Answer: _____ Correct Answer: A Explanation: Need product = +6, sum = -5 → -2 and -3 → (x-2)(x-3)

③ Step 3 of 3

Step 3: Factor completely: 2x^2 + 8x + 6

(A) A. 2(x+1)(x+3)
(B) B. (2x+2)(x+3)
(C) C. 2(x+2)(x+3)
(D) D. 2(x+6)(x+2)

My work / thinking:

My Answer: _____ Correct Answer: A Explanation: Factor out 2 first: 2(x^2+4x+3) = 2(x+1)(x+3)

Extra Work Space:

Q5 · Quadratic Equations

Quadratic Formula

For ax^2 + bx + c = 0: x = (-b +/- sqrt(b^2 - 4ac)) / 2a
Discriminant b^2 - 4ac: >0 two real solutions, =0 one, <0 none.

Example: x^2 - 5x + 6 = 0 → x = (5 +/- 1) / 2 → x = 3 or x = 2

① Step 1 of 3

Step 1: Solve: x^2 - 4x - 5 = 0

(A) A. x=5 or x=-1
(B) B. x=-5 or x=1
(C) C. x=4 or x=-1
(D) D. x=2 or x=-2

My work / thinking:

My Answer: _____ Correct Answer: A Explanation: Factor: (x-5)(x+1) = 0 → x = 5 or x = -1

② **Step 2 of 3**

Step 2: How many real solutions does x^2 + 2x + 5 = 0 have?

(A) A. Two
(B) B. One
(C) C. None
(D) D. Infinitely many

My work / thinking:

My Answer: _____ Correct Answer: C Explanation: Discriminant = 4 - 20 = -16 < 0 → no real solutions

③ **Step 3 of 3**

Step 3: Solve using the quadratic formula: 2x^2 - 7x + 3 = 0

(A) A. x=3 or x=1/2
(B) B. x=7 or x=1
(C) C. x=-3 or x=-1/2
(D) D. x=1 or x=3/2

My work / thinking:

My Answer: _____ Correct Answer: A Explanation: a=2, b=-7, c=3 → x=(7+/-5)/4 → x=3 or x=1/2

Extra Work Space:

Q6 · Inequalities

Linear Inequalities & Absolute Value

FLIP the inequality sign when multiplying or dividing by a NEGATIVE number!
|x - a| < b means -b < x - a < b

Example: -2x < 8 → divide by -2 and FLIP → x > -4

① Step 1 of 3

Step 1: Solve: -3x + 6 > 18

(A) A. x > -4
(B) B. x < -4
(C) C. x > 4
(D) D. x < 4

My work / thinking:

My Answer: _____ Correct Answer: B Explanation: -3x > 12 → divide by -3, FLIP sign → x < -4

② Step 2 of 3

Step 2: Which value satisfies 2x - 3 <= 7?

(A) A. x = 6
(B) B. x = 7
(C) C. x = 5
(D) D. x = 8

My work / thinking:

My Answer: _____ Correct Answer: C Explanation: 2x <= 10 → x <= 5. Only x = 5 satisfies this.

③ Step 3 of 3

Step 3: Solve |x - 2| < 3 and choose the correct interval.

(A) A. x<1 or x>5
(B) B. -1 < x < 5
(C) C. x<-1 or x>5
(D) D. -5 < x < 5

My work / thinking:

My Answer: _____ Correct Answer: B Explanation: -3 < x-2 < 3 → add 2 throughout → -1 < x < 5

Extra Work Space:

Q7 · Exponents & Radicals

Laws of Exponents

a^m * a^n = a^(m+n) | (a^m)^n = a^(mn) | a^0 = 1 | a^(-n) = 1/a^n
Rational exponent: a^(m/n) = (nth root of a)^m

Example: (2^3)^2 = 2^6 = 64 | 3^(-2) = 1/9 | 27^(2/3) = (cube root 27)^2 = 9

① **Step 1 of 3**

Step 1: Simplify: x^3 * x^5

(A) A. x^8
(B) B. x^15
(C) C. x^2
(D) D. 2x^8

My work / thinking:

My Answer: _____ Correct Answer: A Explanation: Add exponents (same base): x^(3+5) = x^8

② **Step 2 of 3**

Step 2: Simplify: (2x^2)^3

(A) A. 2x^6
(B) B. 6x^5
(C) C. 8x^6
(D) D. 8x^5

My work / thinking:

My Answer: _____ Correct Answer: C Explanation: 2^3 * (x^2)^3 = 8 * x^6 = 8x^6

③ **Step 3 of 3**

Step 3: Evaluate: 27^(2/3)

(A) A. 3
(B) B. 6
(C) C. 9
(D) D. 18

My work / thinking:

My Answer: _____ Correct Answer: C Explanation: (cube root of 27)^2 = 3^2 = 9

Extra Work Space:

Q8 · Functions

Function Notation and Evaluation

f(a) means substitute x = a into the function. A function maps each input to EXACTLY one output (vertical line test).

Example: f(x) = x^2 - 3 → f(4) = 16 - 3 = 13

① Step 1 of 3

Step 1: If f(x) = 2x^2 - x + 3, find f(-2).

(A) A. 9
(B) B. 13
(C) C. 7
(D) D. -1

My work / thinking:

My Answer: _____ Correct Answer: B Explanation: f(-2) = 2(4) - (-2) + 3 = 8 + 2 + 3 = 13

② Step 2 of 3

Step 2: Which set of ordered pairs does NOT represent a function?

(A) A. {(1,2),(3,4),(5,6)}
(B) B. {(1,2),(2,3),(3,4)}
(C) C. {(1,2),(1,3),(2,4)}
(D) D. {(2,1),(3,1),(4,1)}

My work / thinking:

My Answer: _____ Correct Answer: C Explanation: Input 1 maps to both 2 and 3 — one input, two outputs → NOT a function

③ Step 3 of 3

Step 3: If g(x) = 3x - 5 and g(a) = 10, find a.

(A) A. a = 3
(B) B. a = 5
(C) C. a = 7
(D) D. a = 15

My work / thinking:

My Answer: _____ Correct Answer: B Explanation: 3a - 5 = 10 → 3a = 15 → a = 5

Extra Work Space:

Q9 · Word Problems

Setting Up Linear Equations from Word Problems

Steps: (1) Define variable (2) Write equation (3) Solve (4) Check answer

Example: "3 times a number plus 2 is 17" → 3n + 2 = 17 → n = 5

① Step 1 of 3

Step 1: A rectangle is 4 cm longer than wide. Perimeter = 48 cm. Find the width.

(A) A. 10 cm
(B) B. 14 cm
(C) C. 8 cm
(D) D. 12 cm

My work / thinking:

My Answer: _____ Correct Answer: A Explanation: 2(w + w+4) = 48 → 4w + 8 = 48 → w = 10 cm

② Step 2 of 3

Step 2: One number is 3 times another. Their sum is 52. What is the smaller number?

(A) A. 13
(B) B. 16
(C) C. 39
(D) D. 26

My work / thinking:

My Answer: _____ Correct Answer: A Explanation: x + 3x = 52 → 4x = 52 → x = 13

③ Step 3 of 3

Step 3: Train A travels at 60 mph. Train B leaves 2 hrs later at 90 mph. How many hours after B departs does it catch A?

(A) A. 3 hours
(B) B. 4 hours
(C) C. 6 hours
(D) D. 5 hours

My work / thinking:

My Answer: _____ Correct Answer: B Explanation: 60(t+2) = 90t → 30t = 120 → t = 4 hours

Extra Work Space:

Q10 · Proportions & Percentages

Ratios, Proportions, and Percent Change

Proportion: a/b = c/d → cross multiply: ad = bc
Percent Change = (New - Old) / Old x 100%

Example: Price goes from $40 to $50: % change = (10/40) x 100 = 25%

① Step 1 of 3

Step 1: Solve the proportion: 5/8 = x/24

(A) A. x = 12
(B) B. x = 15
(C) C. x = 10
(D) D. x = 18

My work / thinking:

My Answer: _____ Correct Answer: B Explanation: 8x = 5 x 24 = 120 → x = 15

② Step 2 of 3

Step 2: A shirt costs $60 and is on sale for $45. What is the percent decrease?

(A) A. 20%

(B) B. 25%
(C) C. 15%
(D) D. 33%

My work / thinking:

My Answer: _____ Correct Answer: B Explanation: (60-45)/60 x 100 = 15/60 x 100 = 25%

③ Step 3 of 3

Step 3: Map scale: 1 inch = 50 miles. Two cities are 3.5 inches apart. What is the actual distance?

(A) A. 150 miles
(B) B. 175 miles
(C) C. 200 miles
(D) D. 125 miles

My work / thinking:

My Answer: _____ Correct Answer: B Explanation: 1/50 = 3.5/d → d = 175 miles

Extra Work Space:

===== ■ GEOMETRY
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Q11 · Parallel Lines & Transversals

Angle Relationships with Parallel Lines

Alternate interior angles = equal. Co-interior (same-side interior) angles = supplementary (sum 180 degrees). Corresponding angles = equal.

Example: If one angle is 65 degrees with parallel lines, its alternate interior angle is also 65 degrees.

① Step 1 of 3

Step 1: Two parallel lines cut by a transversal. A co-interior angle is 72 degrees. What is the other?

(A) A. 72 degrees
(B) B. 108 degrees
(C) C. 18 degrees
(D) D. 118 degrees

My work / thinking:

My Answer: _____ Correct Answer: B Explanation: Co-interior angles are supplementary: 180 - 72 = 108 degrees

② Step 2 of 3

Step 2: Alternate interior angles: (3x + 10) degrees and (5x - 20) degrees. Find x.

(A) A. x = 15
(B) B. x = 10
(C) C. x = 20
(D) D. x = 5

My work / thinking:

My Answer: _____ Correct Answer: A Explanation: 3x + 10 = 5x - 20 → 30 = 2x → x = 15

③ Step 3 of 3

Step 3: Corresponding angles: (4x - 5) degrees and (3x + 15) degrees. Find the angle measure.

(A) A. 75 degrees
(B) B. 85 degrees
(C) C. 95 degrees
(D) D. 65 degrees

My work / thinking:

My Answer: _____ Correct Answer: A Explanation: 4x - 5 = 3x + 15 → x = 20 → angle = 4(20)-5 = 75 degrees

Extra Work Space:

Q12 · Triangles

Triangle Angle Sum & Exterior Angle Theorem

Interior angles of a triangle sum to 180 degrees. Exterior Angle = sum of two non-adjacent interior angles.

Example: Angles 50, 70, x: x = 180 - 50 - 70 = 60 degrees

① Step 1 of 3

Step 1: Two angles of a triangle are 47 degrees and 83 degrees. Find the third angle.

(A) A. 50 degrees
(B) B. 60 degrees
(C) C. 40 degrees
(D) D. 55 degrees

My work / thinking:

My Answer: _____ Correct Answer: A Explanation: 47 + 83 + x = 180 → x = 50 degrees

② Step 2 of 3

Step 2: Exterior angle = 135 degrees. One non-adjacent interior angle = 72 degrees. Find the other.

(A) A. 63 degrees
(B) B. 45 degrees
(C) C. 72 degrees
(D) D. 27 degrees

My work / thinking:

My Answer: _____ Correct Answer: A Explanation: 135 = 72 + x → x = 63 degrees

③ Step 3 of 3

Step 3: Isosceles triangle with vertex angle 40 degrees. What are the base angles?

(A) A. 60 each
(B) B. 70 each
(C) C. 80 each
(D) D. 140 each

My work / thinking:

My Answer: _____ Correct Answer: B Explanation: 40 + 2b = 180 → b = 70 degrees each

Extra Work Space:

Q13 · Congruence & Similarity

Triangle Congruence & Similarity

Congruent (same size & shape): SSS, SAS, ASA, AAS, HL
Similar (same shape, proportional sides): AA, SAS~, SSS~
Area ratio = (side ratio)^2

Example: Triangles with sides 3,4,5 and 6,8,10: ratio = 2:1 → SIMILAR (not congruent)

① Step 1 of 3

Step 1: Triangles have sides 3, 4, 5 and 6, 8, 10. What is their relationship?

(A) A. Congruent
(B) B. Similar only
(C) C. Neither
(D) D. Identical

My work / thinking:

My Answer: _____ Correct Answer: B Explanation: All ratios = 2 → similar, but different sizes → not congruent

② Step 2 of 3

Step 2: Two sides and the included angle are equal. Which theorem applies?

(A) A. SSS
(B) B. AAS
(C) C. SAS
(D) D. ASA

My work / thinking:

My Answer: _____ Correct Answer: C Explanation: SAS = Side-Angle-Side; angle must be BETWEEN the two sides

③ Step 3 of 3

Step 3: Similar triangles with side ratio 2:3. Smaller area = 16 sq cm. Find larger area.

(A) A. 24 sq cm
(B) B. 36 sq cm
(C) C. 9 sq cm
(D) D. 48 sq cm

My work / thinking:

My Answer: _____ Correct Answer: B Explanation: Area ratio = (2/3)^2 = 4/9 → 16 / x = 4/9 → x = 36 sq cm

Extra Work Space:

Q14 · Pythagorean Theorem

Pythagorean Theorem & Special Right Triangles

a^2 + b^2 = c^2 (c = hypotenuse)
45-45-90: legs x, x; hypotenuse x*sqrt(2)
30-60-90: shorter leg x; longer leg x*sqrt(3); hypotenuse 2x

Example: Legs = 6 and 8 → c^2 = 36 + 64 = 100 → c = 10

① Step 1 of 3

Step 1: Right triangle with legs 9 and 12. Find the hypotenuse.

(A) A. 15
(B) B. 18
(C) C. 21
(D) D. sqrt(225)

My work / thinking:

My Answer: _____ Correct Answer: A Explanation: c^2 = 81 + 144 = 225 → c = 15 (3-4-5 triple x 3)

② Step 2 of 3

Step 2: In a 45-45-90 triangle, one leg = 5. Find the hypotenuse.

(A) A. 5*sqrt(2)
(B) B. 10
(C) C. 5*sqrt(3)
(D) D. 10*sqrt(2)

My work / thinking:

My Answer: _____ Correct Answer: A Explanation: Hypotenuse = leg x sqrt(2) = 5*sqrt(2)

③ Step 3 of 3

Step 3: In a 30-60-90 triangle, hypotenuse = 20. Find the longer leg.

(A) A. 10
(B) B. 10*sqrt(3)
(C) C. 20*sqrt(3)
(D) D. 10*sqrt(2)

My work / thinking:

My Answer: _____ Correct Answer: B Explanation: Shorter leg = 10, longer leg = 10*sqrt(3) (opposite 60 degrees)

Extra Work Space:

Q15 · Circles

Circle Theorems: Arcs and Angles

Inscribed angle = 1/2 x central angle (same arc)
Inscribed angle in semicircle = 90 degrees (Thales theorem)
Cyclic quadrilateral: opposite angles are supplementary

Example: Arc = 140 degrees → central angle = 140 → inscribed angle = 70 degrees

① Step 1 of 3

Step 1: Central angle = 120 degrees. What is the inscribed angle on the same arc?

(A) A. 120 deg
(B) B. 60 deg
(C) C. 240 deg
(D) D. 90 deg

My work / thinking:

My Answer: _____ Correct Answer: B Explanation: Inscribed angle = 1/2 x central angle = 60 degrees

② Step 2 of 3

Step 2: A triangle is inscribed in a circle with one side as the diameter. What is the angle opposite the diameter?

(A) A. 90 deg
(B) B. 45 deg
(C) C. 60 deg
(D) D. 180 deg

My work / thinking:

My Answer: _____ Correct Answer: A Explanation: Thales' theorem: inscribed angle in a semicircle = 90 degrees

③ Step 3 of 3

Step 3: In a cyclic quadrilateral, one pair of opposite angles: 85 deg and x. Find x.

(A) A. 85 deg
(B) B. 95 deg
(C) C. 90 deg
(D) D. 105 deg

My work / thinking:

My Answer: _____ Correct Answer: B Explanation: Opposite angles supplementary: 85 + x = 180 → x = 95 degrees

Extra Work Space:

Q16 · Area & Perimeter

Area Formulas for 2D Figures

Triangle: A = (1/2)bh | Trapezoid: A = (1/2)(b1+b2)h | Circle: A = pi*r^2, C = 2*pi*r

Example: Trapezoid, bases 6 and 10, height 4: A = (1/2)(16)(4) = 32

① Step 1 of 3

Step 1: Trapezoid with parallel sides 8 cm and 14 cm, height 6 cm. Find area.

(A) A. 66 sq cm
(B) B. 72 sq cm
(C) C. 48 sq cm
(D) D. 132 sq cm

My work / thinking:

My Answer: _____ Correct Answer: A Explanation: A = (1/2)(8+14)(6) = (1/2)(22)(6) = 66 sq cm

② Step 2 of 3

Step 2: Circle with diameter 10 cm. Find area. (use pi = 3.14)

(A) A. 31.4 sq cm
(B) B. 78.5 sq cm
(C) C. 314 sq cm
(D) D. 62.8 sq cm

My work / thinking:

My Answer: _____ Correct Answer: B Explanation: radius = 5 → A = pi(25) = 78.5 sq cm

③ Step 3 of 3

Step 3: Triangle with base 14 cm and area 63 sq cm. Find the height.

(A) A. 7 cm
(B) B. 9 cm

(C) C. 12 cm
(D) D. 4.5 cm

My work / thinking:

My Answer: _____ Correct Answer: B Explanation: 63 = (1/2)(14)(h) → h = 9 cm

Extra Work Space:

Q17 · Volume & Surface Area

3D Figures: Volume Formulas

Cylinder: V = pi*r^2*h | Cone: V = (1/3)*pi*r^2*h | Sphere: V = (4/3)*pi*r^3

*Example: Cylinder r=3, h=5: V = pi(9)(5) = 45*pi*

① Step 1 of 3

Step 1: Cylinder with radius 4 cm, height 9 cm. Find volume. (pi = 3.14)

(A) A. 452.16 cu cm
(B) B. 113.04 cu cm
(C) C. 226.08 cu cm
(D) D. 904.32 cu cm

My work / thinking:

My Answer: _____ Correct Answer: A Explanation: V = pi(16)(9) = 144*pi = 452.16 cu cm

② Step 2 of 3

Step 2: Same radius and height: ratio of cone volume to cylinder volume?

(A) A. 1:2
(B) B. 1:3
(C) C. 2:3
(D) D. 1:4

My work / thinking:

My Answer: _____ Correct Answer: B Explanation: V_cone = (1/3)*V_cylinder → ratio 1:3

③ Step 3 of 3

Step 3: Sphere with radius 6 cm. Find volume. (pi = 3.14)

(A) A. 904.32 cu cm
(B) B. 452.16 cu cm
(C) C. 113.1 cu cm
(D) D. 2412 cu cm

My work / thinking:

My Answer: _____ Correct Answer: A Explanation: V = (4/3)*pi*(216) = 288*pi = 904.32 cu cm

Extra Work Space:

Q18 · Coordinate Geometry

Distance, Midpoint Formulas

Distance: d = sqrt((x2-x1)^2 + (y2-y1)^2)
Midpoint: M = ((x1+x2)/2, (y1+y2)/2)

Example: Distance between (1,2) and (4,6): d = sqrt(9+16) = sqrt(25) = 5

① Step 1 of 3

Step 1: Find the distance between (-2, 3) and (4, 11).

(A) A. 10
(B) B. 12
(C) C. 8
(D) D. sqrt(136)

My work / thinking:

My Answer: _____ Correct Answer: A Explanation: d = sqrt(36+64) = sqrt(100) = 10

② Step 2 of 3

Step 2: Find the midpoint of the segment from (-4, 6) to (8, -2).

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

My work / thinking:

My Answer: _____ Correct Answer: A Explanation: M = ((-4+8)/2, (6-2)/2) = (4/2, 4/2) = (2, 2)

③ Step 3 of 3

Step 3: Midpoint of AB is (3, 5). Point A is (1, 9). Find point B.

(A) A. (5, 1)
(B) B. (4, 2)
(C) C. (7, 1)
(D) D. (2, 7)

My work / thinking:

My Answer: _____ Correct Answer: A Explanation: (1+Bx)/2 = 3 → Bx = 5; (9+By)/2 = 5 → By = 1 → B = (5, 1)

Extra Work Space:

Q19 · Transformations

Reflections, Rotations, and Translations

Translation (a,b): (x,y) -> (x+a, y+b)
Reflect over x-axis: (x,y) -> (x,-y)
Reflect over y-axis: (x,y) -> (-x,y)
Rotate 90 deg CCW: (x,y) -> (-y,x)

Example: Reflect (3,-4) over y-axis -> (-3,-4)

① Step 1 of 3

Step 1: Point (5, -3) reflected over the x-axis. New coordinates?

(A) A. (-5,-3)
(B) B. (-5,3)
(C) C. (5,3)
(D) D. (3,5)

My work / thinking:

My Answer: _____ Correct Answer: C Explanation: Reflect over x-axis: y changes sign → (5, -3) becomes (5, 3)

② **Step 2 of 3**

Step 2: Point (2, 6) translated by (x-3, y+4). New coordinates?

(A) A. (5,2)
(B) B. (-1,10)
(C) C. (-1,2)
(D) D. (5,10)

My work / thinking:

My Answer: _____ Correct Answer: B Explanation: (2-3, 6+4) = (-1, 10)

③ **Step 3 of 3**

Step 3: Point A(1, 2) rotated 90 degrees CCW about origin. New coordinates?

(A) A. (2,1)
(B) B. (-2,1)
(C) C. (1,-2)
(D) D. (-1,2)

My work / thinking:

My Answer: _____ Correct Answer: B Explanation: 90 deg CCW rule: (x,y) -> (-y,x) => A(1,2) -> (-2, 1)

Extra Work Space:

Q20 · Quadrilaterals & Polygons

Properties of Quadrilaterals

Parallelogram: opposite sides parallel & equal, opposite angles equal, diagonals bisect each other.
Rhombus: all sides equal, diagonals are perpendicular bisectors.
Sum of interior angles of n-gon = (n-2) x 180 degrees

Example: Parallelogram: if one angle = 70 deg, adjacent angle = 110 deg (supplementary)

① Step 1 of 3

Step 1: In parallelogram ABCD, angle A = 65 degrees. What is angle C?

(A) A. 115 deg
(B) B. 65 deg
(C) C. 130 deg
(D) D. 90 deg

My work / thinking:

My Answer: _____ Correct Answer: B Explanation: Opposite angles of a parallelogram are equal: angle C = 65 degrees

② Step 2 of 3

Step 2: Diagonals of a rhombus are 10 cm and 24 cm. Find the side length.

(A) A. 12 cm
(B) B. 13 cm
(C) C. 15 cm
(D) D. 17 cm

My work / thinking:

My Answer: _____ Correct Answer: B Explanation: Diagonals bisect perpendicularly: legs = 5 and 12 → side = sqrt(25+144) = sqrt(169) = 13 cm

③ Step 3 of 3

Step 3: What is the sum of interior angles of a hexagon?

(A) A. 540 deg
(B) B. 720 deg
(C) C. 900 deg
(D) D. 1080 deg

My work / thinking:

My Answer: _____ Correct Answer: B Explanation: (6-2) x 180 = 4 x 180 = 720 degrees

Extra Work Space: