1) Difficulty ordering (easiest → hardest) with short reason

1. Simple Pythagorean checks and area with perpendicular sides (questions: largest area with sides 12 & 20; 3-4-5 area; B path distance; net walking problem) — fluent calculation and unit conversion.
2. Chord and sector of circle (radius 12, 60°) — requires formula recall but simple trig.
3. Isosceles triangle base/area to side length; square/triangle equal perimeter — straightforward formula application.
4. Parallelogram angles; isosceles angle max/min — reasoning about angle relationships.
5. Pythagorean triple existence questions and construction for odd n — requires pattern recognition and algebraic formula.
6. Right triangle with one leg 9 and other two consecutive integers — algebraic set-up solving for integer side.
7. Slackrope (piecewise linear segments) — two segment distance sum, careful geometry.
8. Rectangle corner distances (F, I, D, A) — requires considering which distances are side vs diagonal, choosing configuration to minimize distance (shorter possible scenario).
9. Two vertical poles and shortest rope between tops — 3D thinking collapsed to 2D right triangle (difference of heights and base distance) but must recognise straight-line distance between top points.

2) Per-question evaluation (student answer, correct?, quick solution)

- Rectangle corner problem — student: 4 — CORRECT. Explanation: choose F-D = 3 (side) and F-I = 5 (diagonal). Then other side = 4 (Pythagoras). Minimum possible distance F-A = 4.
- Isosceles triangle base 24, area 60 — student: 13 — CORRECT. Height = 2A/base = 120/24 = 5. Half base =12. Side = sqrt(12^2 +5^2)=13.
- Slackrope with poles 15m, separated 14m; person 5m from left pole at height 3m — student: 28 — CORRECT. Distances: left segment sqrt(5^2+12^2)=13; right segment sqrt(9^2+12^2)=15. Total 28.
- Right triangle, one leg 9, other two sides consecutive integers — student: 90 — CORRECT. Solve 9^2 + k^2 = (k+1)^2 → k =40. Perimeter 9+40+41=90.
- H walks mixing meters & feet — student: 40 — CORRECT. Convert 9 m → 29.52756 ft; net south displacement = 32 ft; east = 24 ft; distance sqrt(24^2+32^2)=40 ft.
- Largest area of right triangle with sides 12 and 20 — student: 120 — CORRECT. Max when perpendicular: area = 0.5*12*20=120.
- Right triangle longest side 5, shortest 3 — student: 6 — CORRECT. Triangle is 3-4-5, area = 0.5*3*4=6.
- B walks 1/2 S, 3/4 E, 1/2 S — student: 5/4 — CORRECT. Net displacement sqrt(1^2 + (3/4)^2)=5/4.
- Poles 39 ft & 15 ft, base 45 ft — student: sqrt(2601) — CORRECT (sqrt2601 = 51). Shortest rope is straight line between tops: sqrt(45^2 + (39-15)^2)=51 ft.
- Circle chord (R=12, angle 60°) — student: 12 — CORRECT. Chord = 2R sin(θ/2)=24*sin30°=12.
- Area of smaller sector (60°, R=12) — student: 24π — CORRECT. Area = (60/360)*π*12^2 = (1/6)*144π =24π.
- Square and triangle equal perimeters (6.2,8.3,9.5) — student: 36 — CORRECT. Perimeter triangle =24; square side 6; area 36.
- Parallelogram angle E=41° — student: 41 and 139 — CORRECT. Opposite equal, adjacent supplementary.
- Pythagorean triple containing 9 and two consecutive integers — student: 9,40,41 — CORRECT.

Formula yields (n,(n^2-1)/2,(n^2+1)/2) for odd n.
- For every odd n>1, is there a triple? — student: yes — CORRECT. Constructive formula above gives a primitive triple.
- Right triangle leg 48, hypotenuse 52 — student: 20 — CORRECT. Other leg sqrt(52^2-48^2)=20.
- Greatest possible angle in an isosceles triangle that has a 54° angle — student: 72 — CORRECT. Max when 54 is base angle → vertex = 180-2*54=72.
- Least possible angle when triangle has a 54° angle — student: 54 — CORRECT. 54 can be one of equal angles, so smallest is 54.

3) ACARA v9 curriculum mapping (skills targeted)

- Measurement and Geometry: applying Pythagoras, distance, chords and sectors, properties of triangles and parallelograms.
- Number and Algebra: manipulation of algebraic equations to find integer solutions; working with units and conversions.
- Mathematical proficiencies: Understanding, Fluency, Problem Solving, Reasoning — construction and justification of results.

4) Rubric (4-level) — use for marking written solutions

1. Exemplary (4): Correct answer, complete method shown, units correct, clear reasoning and efficient strategy, answer justified.
2. Proficient (3): Correct answer, method shown but minor omissions in explanation; units OK.
3. Developing (2): Work shows partial understanding, arithmetic or unit mistakes, correct idea not fully executed.
4. Beginning (1): Incorrect answer, missing or wrong method, no justification.

5) Teacher comments (firm, direct — Amy Chua cadence)

You did well — most answers are correct and your arithmetic is strong. But I will not praise sloppiness. When you solve a geometry problem, write the model: coordinates, side labels, or the triangle you assume. If you leave out unit conversions you will be wrong on a contest problem — here you converted meters to feet correctly; that is the kind of attention to detail I demand. For Pythagoras tasks, practice the standard triples and the n→(n^2-1)/2,(n^2+1)/2 construction for odd n so you can produce them instantly. When problems ask for a minimum or maximum, do not accept the first configuration that fits; check alternate interpretations (side vs diagonal). That subtle thinking produced the correct minimal distance of 4 in the rectangle problem — good. Your reasoning on slackrope, poles, chord and sector shows you know when to use distance formula and sector area formula — good. For full marks next time, show each step explicitly: label points, record formulas used, show unit conversions, and box your final answer. No credit for mental steps you do not write. Push for precision and neat presentation. You are capable — now be rigorous.

Keep practicing structured write-ups. I expect each future solution to have: 1) Diagram/coordinates, 2) Equations used, 3) Substitution, 4) Final boxed answer with units. Do it now; do it perfectly.

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