

Difference of Squares — Practice

CKSTEM Math Problem Solving · Grades 5–8

1 DIFFERENCE OF SQUARES IDENTITY

Compute 21 squared minus 19 squared.

WORK IT OUT HERE

2 DIFFERENCE OF SQUARES IDENTITY

Compute 32 squared minus 28 squared.

WORK IT OUT HERE

3 DIFFERENCE OF SQUARES IDENTITY

Compute 105 squared minus 95 squared in your head.

WORK IT OUT HERE

4 BORDER = SUM OF SIDES

A 3-by-3 photo board grows by one row and one column, becoming a 4-by-4 board. How many new squares were added?

WORK IT OUT HERE

5 BORDER = SUM OF SIDES

A 7-by-7 garden grid is enlarged by one row and one column to a 8-by-8 grid. How many new garden squares appear in the border?

WORK IT OUT HERE

6 BORDER = SUM OF SIDES

A 12-by-12 tile floor is expanded by one row and one column to a 13-by-13 floor. How many new tiles are needed for the border?

WORK IT OUT HERE

7 TWO SQUARES, ONE MULTIPLICATION

A wall mosaic comes in two square sizes: 13 by 13 tiles and 7 by 7 tiles. How many more tiles are in the bigger mosaic?

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8 TWO SQUARES, ONE MULTIPLICATION

Two square gardens are 25 metres and 15 metres on a side. How much more area does the bigger garden cover?

WORK IT OUT HERE

9 TWO SQUARES, ONE MULTIPLICATION

Two square fields are 28 metres and 22 metres on a side. How much more area does the bigger field have?

WORK IT OUT HERE

10 SUM TIMES DIFFERENCE

A large square has side 12 cm. A smaller square has side 8 cm. By how much is the area of the large square bigger than the area of the small one?

WORK IT OUT HERE

11 SUM TIMES DIFFERENCE

A larger square has side 29 cm. A smaller square has side 21 cm. By how much is the larger area bigger than the smaller area?

WORK IT OUT HERE

12 SUM TIMES DIFFERENCE

Two square gardens have sides 57 m and 43 m. How much more land does the bigger garden cover than the smaller one?

WORK IT OUT HERE

13 REVERSE THE IDENTITY

A bigger square uses 84 more tiles than a smaller square. The bigger side is 2 tiles longer than the smaller. What is the bigger side length?

WORK IT OUT HERE

14 REVERSE THE IDENTITY

A bigger square garden uses 240 more square metres than a smaller square garden. The bigger side is 6 metres longer than the smaller. What is the bigger side length?

WORK IT OUT HERE

15 REVERSE THE IDENTITY

A bigger square field uses 576 more square metres than a smaller one. The bigger side is 8 metres longer than the smaller. What is the bigger side length?

WORK IT OUT HERE

16 FACTOR PAIRS OF THE DIFFERENCE

Two whole-number square side lengths have an area difference of exactly 45 square units. The bigger side must be less than 20. How many such pairs of sides are possible?

WORK IT OUT HERE

17 FACTOR PAIRS OF THE DIFFERENCE

Two whole-number square side lengths have an area difference of exactly 189. The bigger side must be less than 30. How many such pairs of sides are possible?

WORK IT OUT HERE

18 FACTOR PAIRS OF THE DIFFERENCE

Two whole-number square side lengths have an area difference of exactly 1155. The bigger side must be less than 50. How many such pairs of sides are possible?

WORK IT OUT HERE

19 FACTOR PAIRS, BOUNDED WINDOW

Two whole-number square side lengths have an area difference of exactly 72. The bigger side must be less than 15. The smaller side must be at least 2. How many such pairs are possible?

WORK IT OUT HERE

20 FACTOR PAIRS, BOUNDED WINDOW

Two whole-number square side lengths have an area difference of exactly 240. The bigger side must be less than 25. The smaller side must be at least 4. How many such pairs are possible?

WORK IT OUT HERE

21 FACTOR PAIRS, BOUNDED WINDOW

Two whole-number square side lengths have an area difference of exactly 945. The bigger side must be less than 40. The smaller side must be at least 5. How many such pairs are possible?

WORK IT OUT HERE

Answer Key

Each answer comes with a hint that names the move. The tag says which video to rewatch if you are stuck.

1. 80 — *Difference of Squares Identity*

Add the two numbers, subtract the two numbers, multiply those two results.

2. 240 — *Difference of Squares Identity*

Replace the two squares with sum times difference, then multiply.

3. 2000 — *Difference of Squares Identity*

The two numbers are 10 apart — rewrite as the sum times that gap.

4. 7 squares — *Border = Sum of Sides*

Add the old side length and the new side length — the border holds that many.

5. 15 squares — *Border = Sum of Sides*

The new L-border is old-side plus new-side patches in total.

6. 25 tiles — *Border = Sum of Sides*

Sum the two side lengths — that's the L-shaped border count.

7. 120 tiles — *Two Squares, One*

Multiplication

Add the two side lengths, subtract the two side lengths, then multiply those results.

8. 400 square metres — *Two Squares, One*
Multiplication

Skip squaring — use sum of the sides times difference of the sides.

9. 300 square metres — *Two Squares, One*
Multiplication

Sides are close — one multiplication of sum and difference gives the answer.

10. 80 cm² — *Sum Times Difference*

Sum \times difference: add the sides, subtract the sides, multiply those two pieces — it equals the difference of the areas without squaring either side.

11. 400 cm² — *Sum Times Difference*

Add the two sides for one factor, subtract them for the other, and multiply — no squaring needed.

12. 1400 m² — *Sum Times Difference*

Use sum \times difference of the two sides — that product equals the area difference without computing either square.

13. 22 tiles — *Reverse the Identity*

Divide the tile gap by the side gap to get the sum of the sides; then average with the side gap to find the bigger side.

14. 23 metres — *Reverse the Identity*

Area gap divided by side gap gives the sum of the sides — then split that sum around the side gap.

15. 40 metres — *Reverse the Identity*

Run the identity backwards: area gap over side gap is the sum of sides; the bigger side is halfway above that average.

16. 2 pairs — *Factor Pairs of the Difference*

List the factor pairs of the area difference whose two factors share the same parity, convert each to a side pair, then keep those passing the bound.

17. 2 pairs — *Factor Pairs of the Difference*

Walk every factor pair of the area gap with both factors same parity; turn each into sides and check the bound.

18. 3 pairs — *Factor Pairs of the Difference*

Factor the area gap, take each same-parity factor pair, average and half-difference for the sides, then filter by the bound.

19. 2 pairs — *Factor Pairs, Bounded Window*

List same-parity factor pairs of the area gap, convert to sides, then filter against both the upper bound on the bigger side and the lower bound on the smaller side.

20. 4 pairs — *Factor Pairs, Bounded Window*

Factor the gap, walk each same-parity pair, turn each into sides, then intersect the upper and lower bounds.

21. 2 pairs — *Factor Pairs, Bounded Window*

Same factor-pair recipe — convert every same-parity factor pair into sides, then keep only those passing both bounds.