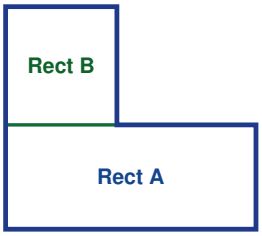
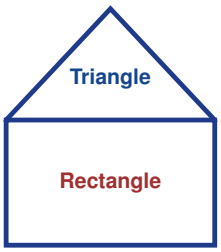
# Area of Composite Figures

| Name: _____ | Date: _____ | Score: _____ / 17 |
|---|---|---|

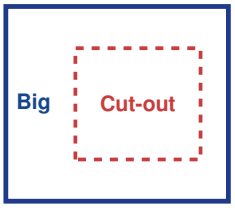
A **composite figure** is a shape built by sticking simpler shapes together—or by cutting one shape out of another. The strategy is to break the figure into parts you already know (rectangles, triangles, trapezoids, semicircles), find each area, and then *add* them up—or *subtract* if a piece has been removed. The trickiest step is deciding *how* to split the figure, so always look for familiar shapes and label the dimensions you need. You will use this skill constantly in real life: flooring, paint coverage, oddly shaped yards—it all starts here!



L-shape: Add two rectangles



House shape: Rect + Tri



Subtract: Big − cut-out

## Key Concepts & Quick Review

**Add method:** split into non-overlapping pieces $\Rightarrow A_{\text{total}} = A_1 + A_2 + \cdots$
**Subtract method:** start with an enclosing shape, remove the cut-out $\Rightarrow A = A_{\text{big}} - A_{\text{hole}}$

**Tip:** label all dimensions carefully before computing — shared sides often provide the missing measurement.

## Examples

① An L-shaped room: the large rectangle is $10\,m \times 6\,m$ and a $4\,m \times 3\,m$ rectangle is cut from one corner. Find the floor area.

**Think It Through:** This shape is easiest with subtraction. First find the area of the full outer rectangle: $10 \times 6 = 60\,m^2$. Then find the cut-out rectangle: $4 \times 3 = 12\,m^2$. Subtract the missing part from the whole shape, $60 - 12 = 48\,m^2$. Subtraction works well when the missing part has simple dimensions.

**Answer:** $48\,m^2$

② A house-shaped figure has a rectangle $8\,m \times 5\,m$ and a triangular roof with base $8\,m$ and height $3\,m$. Find the total area.

**Think It Through:** Split the composite figure into two familiar parts: a rectangle and a triangle. The rectangle has area $8 \times 5 = 40\,m^2$. The roof triangle has area $\frac{1}{2}(8)(3) = 12\,m^2$. Add the two parts because they do not overlap: $40 + 12 = 52\,m^2$. This is the addition method for composite area.

**Answer:** $52\,m^2$

## Practice Problems

*Find the area of each composite figure using addition or subtraction.*

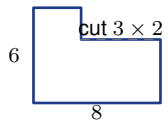
**1.** Rectangle $10 \times 8$ plus rectangle $4 \times 3$ _____

**2.** Rectangle $12 \times 6$ plus triangle with base $12$ and height $4$ _____

**3.** Large rectangle $9 \times 7$ minus a rectangular hole $3 \times 2$ _____

**4.** Rectangle $15 \times 10$ minus triangle with base $5$ and height $6$ _____

**5.** L-shape: outer $8 \times 6$; cut $3 \times 2$ _____




**6.** T-shape: $12 \times 3$ top, $4 \times 8$ stem _____

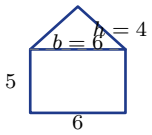
**7.** Rectangle $6 \times 4$ plus trapezoid with bases $6, 10$ and height $3$ _____

**8.** House shape: rectangle $10 \times 6$ plus triangular roof with base $10$ and height $5$ _____

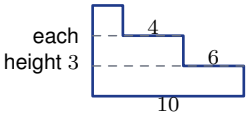
**9.** Large rectangle $20 \times 12$ minus inner rectangle $8 \times 6$ _____

**10.** Two rectangles, $5 \times 8$ and $5 \times 6$, side by side _____

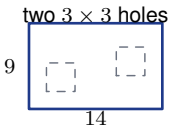
**11.** Pentagon shape: rectangle $6 \times 5$ plus triangle with base $6$ and height $4$ _____




**12.** Step shape: $10 \times 3 + 6 \times 3 + 4 \times 3$ (stacked) _____




**13.** Rectangle $14 \times 9$ minus two square holes, each $3 \times 3$ _____




**14.** Arrowhead shape: rectangle $8 \times 4$ plus triangle with base $4$ and height $5$ _____

**15.** Parallelogram with base $10$ and height $6$ plus triangle with base $5$ and height $6$ _____

### Study Tips

- **Sketch first, split second.** Draw the dividing line(s) on the figure before writing any formula.
- Missing side lengths can often be **calculated** from given dimensions — look for what cancels or combines to give you what you need.
- For a frame or border, the **subtract method** is usually faster: outer area minus inner area, with no need to split the border into strips.

## Word Problems

**16.** A swimming pool deck has an L-shape. The full outer rectangle is $20\ m$ by $12\ m$. A rectangular pool area of $14\ m$ by $8\ m$ is cut into one corner. Deck tiles cost $\$18.50$ per square metre. Find the deck area and the total tiling cost.

_____

**17.** A neighbourhood park is designed in a cross shape. A horizontal rectangle $30\ m$ by $8\ m$ overlaps a vertical rectangle $8\ m$ by $30\ m$ at their centres. The overlapping square is $8\ m$ by $8\ m$. Find the total park area. Grass seed costs $\$2.40$ per $m^2$. How much does seeding the whole park cost?

_____

# Answer Keys

1) 92
2) 96
3) 57
4) 135
5) 42
6) 68
7) 88
8) 85
9) 192
10) 70
11) 42
12) 60
13) 108
14) 42
15) 90
16) $128\ m^2$; cost \$2,368
17) $416\ m^2$; cost \$998.40

## Step-by-Step Explanations

**Strategy:** For Angle Relationships with Parallel Lines and Transversals, name the angle pair first, then decide whether the angles are equal or supplementary. The important angle habit is naming the relationship before setting equal or adding to $180^{circ}$.

**Practice 1:** Two corresponding angles are formed by parallel lines and a transversal. One angle is $55°$. Find the other angle. **Answer:** $55°$

In the opening example, identify the angle pair first; corresponding and alternate angles are equal, while same-side interior angles are supplementary.

**Practice 15:** Two alternate exterior angles measure $(4x - 8)°$ and $(2x + 16)°$. Find each angle measure. **Answer:** $40°$ each

For the end-of-set item, identify the angle pair first; corresponding and alternate angles are equal, while same-side interior angles are supplementary.

**Word-problem notes:**

**16. Answer:** $5x + 12 = 8x - 15 \Rightarrow x = 9$; angle $= 57°$; parallel tracks require equal corresponding angles.

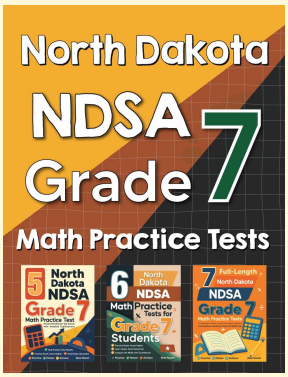
If the tracks are parallel, corresponding angles created by the same transversal must be equal. Set the expressions equal: $5x + 12 = 8x - 15$. Solving gives $27 = 3x$, so $x = 9$. Substitute into either expression to get the angle measure: $5(9) + 12 = 57°$. Equal corresponding angles are one of the standard tests for parallel lines, so this confirms the tracks are parallel.

**17. Answer:** $(3k + 20) + (5k - 12) = 180 \Rightarrow k = 21.5$; angles: $84.5°$ and $95.5°$; brace leans slightly past perpendicular.

Co-interior angles on parallel lines are supplementary, so they add to $180°$. Write $(3k + 20) + (5k - 12) = 180$. Simplifying gives $8k + 8 = 180$, so $8k = 172$ and $k = 21.5$. The two angles are then $3(21.5) + 20 = 84.5°$ and $5(21.5) - 12 = 95.5°$. Since they add to $180°$, the relationship checks out. One angle is slightly more than $90°$, so the brace leans a little past perpendicular.

# Want Even More Practice?

## Check Out Our Other North Dakota NDSA Test Books!




### North Dakota NDSA Grade 7 Math Preparation Bundle

18 full-length practice tests across three books (5 + 6 + 7)

No repeated questions—maximum practice value!

**18 Tests!**
**3 Books**
**One Bundle**

**Important:** All our test books contain **unique, completely different tests** from each other! Each book offers fresh practice questions—no repeats!

### 5 Practice Tests

- ✓ 5 complete practice tests with detailed explanations
- ✓ Perfect foundation for NDSA test preparation
- ✓ Builds confidence and test-taking skills
- ✓ High-quality questions aligned with state standards

**Start your practice journey!**

### 6 Practice Tests

- ✓ 6 complete practice tests with detailed explanations
- ✓ **Unique tests**—different from the 5 tests book
- ✓ Perfect for more practice after mastering 5 tests
- ✓ Builds even more confidence and test-taking skills
- ✓ Same high-quality questions aligned with standards

**Take your practice to the next level!**

### 7 Practice Tests

- ✓ 7 complete practice tests for maximum preparation
- ✓ **Unique tests**—different from 5 and 6 tests books
- ✓ The most comprehensive practice for Grade 7
- ✓ Ideal for students aiming for top scores
- ✓ Extensive practice builds mastery and confidence

**Go all the way with comprehensive practice!**