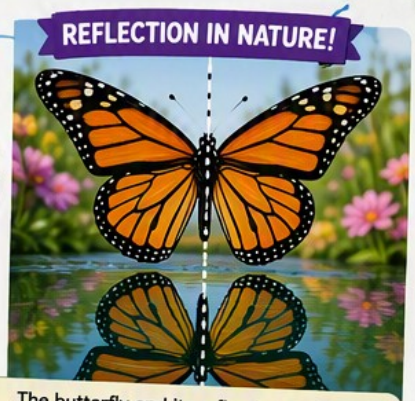
Think in shapes. Solve with confidence. Succeed on the TSIA2!

GEOMETRIC & SPATIAL REASONING

for the TSIA2 Math Test

★ Visualize it. Analyze it. Solve it. *You've got this!*



The butterfly and its reflection show a line of symmetry—just like a geometric reflection across a line.

1 MEASUREMENT & UNIT CONVERSIONS

Understand and convert units of length, weight, capacity, time, temperature, and more.

EXAMPLES

12 in = 1 ft
36 in = 3 ft

1 lb = 16 oz
2.5 lb = 40 oz

1 gal = 4 qt
3 gal = 12 qt

$°F = (°C \times \frac{9}{5}) + 32$

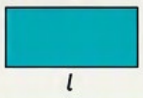
TIP: Set up conversions using ratios so the units cancel out!

2 PERIMETER & AREA

Find distance around a shape (perimeter) and the space inside a shape (area).

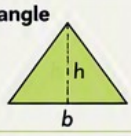
EXAMPLES

Rectangle



Perimeter = $2(l + w)$
Area = $l \times w$

Triangle



Area = $\frac{1}{2} bh$

Circle

Circumference = $2\pi r$
Area = πr^2

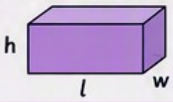
TIP: Label your sides. Use the right formula!

3 SURFACE AREA & VOLUME

Find the surface area (outside) and volume (inside) of three-dimensional figures.

EXAMPLES

Rectangular Prism



SA = $2(lw + lh + wh)$
V = lwh

Cylinder

SA = $2\pi r^2 + 2\pi rh$
V = $\pi r^2 h$

Sphere

SA = $4\pi r^2$
V = $\frac{4}{3} \pi r^3$

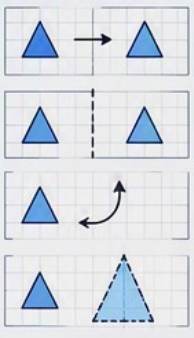
TIP: Know what each variable represents and include the correct units!

4 TRANSFORMATIONS

Understand how figures move on a coordinate plane.

TYPES OF TRANSFORMATIONS

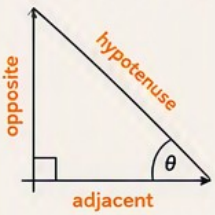
1. Translation (slide)
2. Reflection (flip)
3. Rotation (turn)
4. Dilation (resize)



TIP: Look for changes in position, size, or orientation.

5 RIGHT TRIANGLE TRIGONOMETRY

Use trigonometric ratios to solve for missing sides or angles.



SOH CAH TOA

$\sin \theta = \frac{opp}{hyp}$

$\cos \theta = \frac{adj}{hyp}$

$\tan \theta = \frac{opp}{adj}$

EXAMPLE:

If $\theta = 30°$ and hypotenuse = 10, find the opposite side.

$\sin 30° = \frac{opp}{10} \rightarrow \frac{1}{2} = \frac{opp}{10} \rightarrow opp = 5$

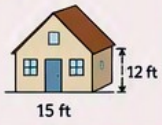
TIP: Memorize SOH CAH TOA and special right triangles: 30-60-90 and 45-45-90.

6 GEOMETRY APPLICATIONS

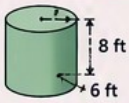
Apply geometry to real-world situations and problem solving.

EXAMPLES

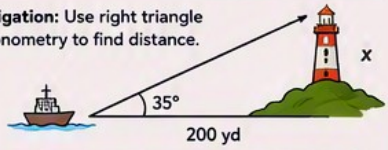
- **Architecture:** Find the area of a roof to determine shingles.



- **Engineering:** Calculate the volume of a tank.



- **Navigation:** Use right triangle trigonometry to find distance.



TIP: Break problems into steps. Draw it. Label it. Solve it!

BELIEVE IN YOURSELF!

Practice today. Be prepared tomorrow. Achieve your goals!

VISUALIZE See the shapes in your mind.

PRACTICE Work problems every day.

FOCUS Check your work and learn from it.

SUCCEED You are capable of amazing things!

YOU CAN DO THIS!