

# Geometry Answer Key

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## Warm-up:

### 1. Triangle formulas:

- Standard formula (half times base times height):  $K = \frac{1}{2}bh$
- SAS area:  $K = \frac{1}{2}ab \sin C$  (and cyclic permutations)
- Heron's formula:  $K = \sqrt{s(s-a)(s-b)(s-c)}$
- Inradius formula:  $K = r \cdot s$
- Circumradius formula:  $K = \frac{abc}{4R}$
- Equilateral Triangle formula:  $K = \frac{\sqrt{3}}{4}a^2$
- ...and several more advanced formulas

### 2. Law of Sines/Cosines:

- (Extended) Law of Sines:  $\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c} = \frac{1}{2R}$
- Law of Cosines:  $c^2 = a^2 + b^2 - 2ab \cos C$  (and cyclic variants)

### 3. Similarity and Congruence:

- Similarity: AA, ASA, SSS
- Congruence: SSS, SAA, ASA, **Not ASS**

## Exercises:

1. E
2. A
3. B
4. D
5. C
6. C
7. E
8. D
9. B
10. B