Math III Similarity Review

Angle-Angle Similarity (AA) Postulate – If two angles of one triangle are congruent to two angles in another triangle, then the two triangles are similar

Side-Angle-Side Similarity (SAS) Postulate – If an angle of one triangle is congruent to an angle of a second triangle, and the sides that include the two angles are proportional, then the two triangles are similar

Side-Side-Side Similarity (SSS) Postulate – If the corresponding sides of two triangles are proportional, then the triangles are similar.
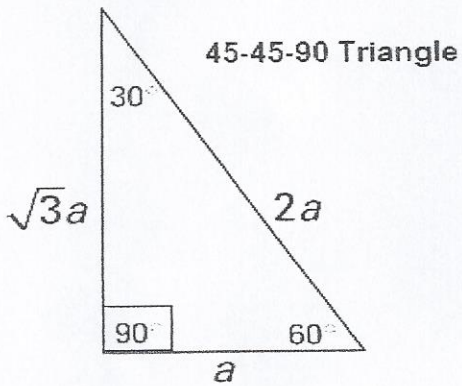
Side-Splitter Theorem

If a line is parallel to one side of a triangle and intersects the other two sides, then it divides those sides proportionally.
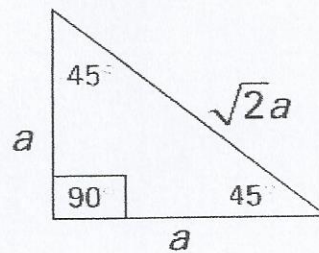
If $\overleftrightarrow{RS} \| \overleftrightarrow{XY}$, then $\dfrac{XR}{RQ} = \dfrac{SY}{SQ}$
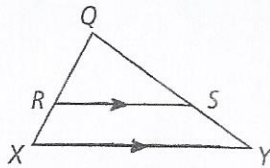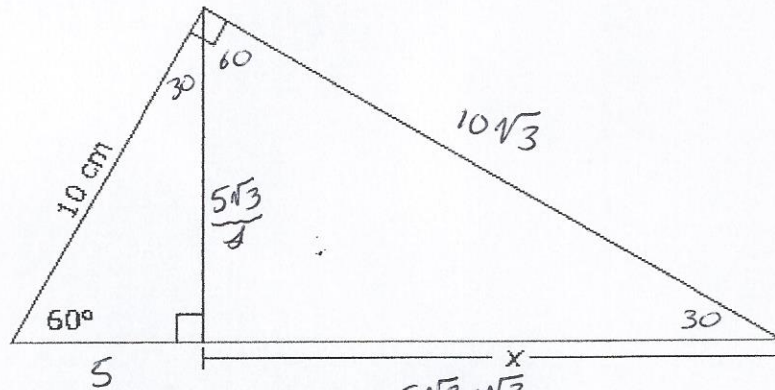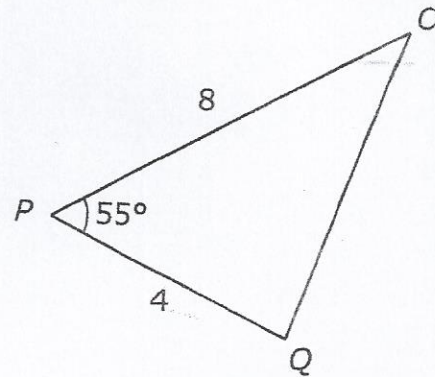

Special Right triangles

45-45-90 Triangle

30-60-90 Triangle

1.

What is the value of x in the triangle below?

30   60

10 cm

$\frac{5\sqrt{3}}{4}$

$10\sqrt{3}$

60°

30

S

x

$5\sqrt{3} \cdot \sqrt{3}$
$= 5\sqrt{9}$
$= 5 \cdot 3$
$= 15$

A $\frac{5\sqrt{3}}{2}$ cm

B $5\sqrt{3}$ cm

C   10 cm

D   15 cm

2. Triangles LMN and OPQ are shown below.

$\frac{12}{8} = \frac{10}{OQ}$

12

M   55°

10

N

L

8

P   55°

4

Q

O
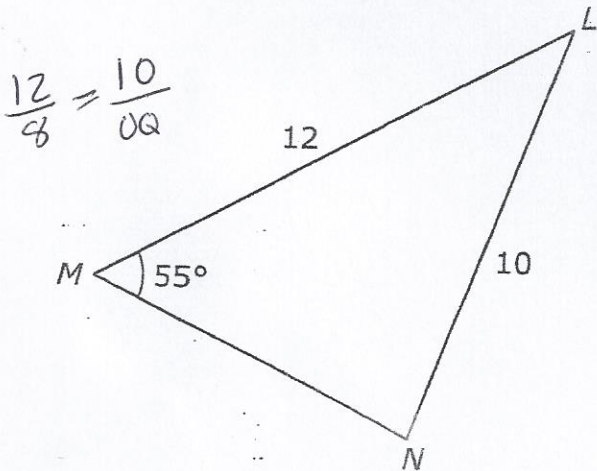
What additional information will prove the triangles are similar?

A. $OQ = 6$ C. $MN = 9$
B. $< LMN \cong < QOP$ D. $< NLM \cong < QOP$ proves by Similarity (AA)

3. What are the angle measures of the triangle?

   A. 30^0, 60^0, and 90^0 C. 60^0, 60^0, and 60^0

   B. 45^0, 45^0, and 90^0 D. They cannot be determined

$7\sqrt{3}$ $14\sqrt{3}$ $2d$

21

$\cancel{d\sqrt{3}} \rightarrow 7\sqrt{3}\sqrt{3}$
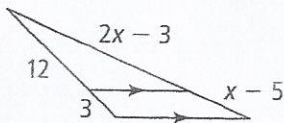
$= 7\sqrt{9}$

$= 7\cdot3$
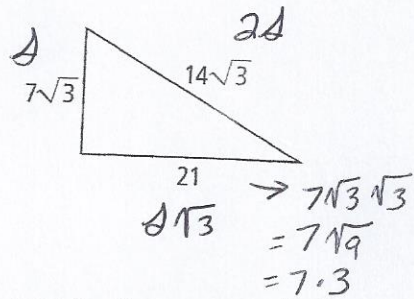
4. In the center of town there is a square park with side length 30 ft. If a person walks from one corner of the park to the opposite corner, how far does the person walk? Round your answer to the nearest foot.

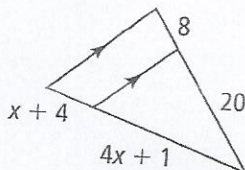   A. 21 ft   B. 42 ft   C. 52 t   D. 60ft

$30\sqrt{2} \approx 42$

$30\sqrt{2}$ 45^0 30

45^0 30

5. Solve for x

$2x - 3$

12

3 $x - 5$
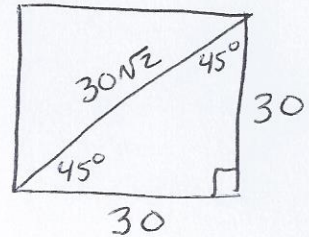
$$\frac{3}{12} = \frac{x-5}{2x-3}$$

$3(2x-3) = 12(x-5)$

$6x - 9 = 12x - 60$

$-9 = 6x - 60$

$51 = 6x$

$x = 8.5$

6. Solve for x

8

$x + 4$ 20

$4x + 1$

$$\frac{8}{20} = \frac{x+4}{4x+1}$$

$8(4x+1) = 20(x+4)$

$32x + 8 = 20x + 80$

$12x + 8 = 80$

$12x = 72$

$x = 6$

7. Solve for x

$12 - x$

$x + 3$ 6

4
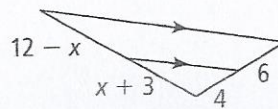
$$\frac{4}{6} = \frac{x+3}{12-x}$$

$4(12-x) = 6(x+3)$

$48 - 4x = 6x + 18$

$+4x \quad +4x$

$48 = 10x + 18$

$30 = 10x$

$x = 3$

8. Which choice shows a pair of similar figures?

A

9

12

6

9

$$\frac{9}{6} = \frac{12}{9}$$
$$72 \neq 81 \; X$$

B

6

2

8

4

$$\frac{6}{2} = \frac{8}{4}$$
$$24 = 16 \; X$$

C

5   4   4

4

4   5   5

4

5

$$\frac{4}{5} = \frac{5}{4}$$
$$16 = 25 \; X$$

(D)

6   3

3   3

3
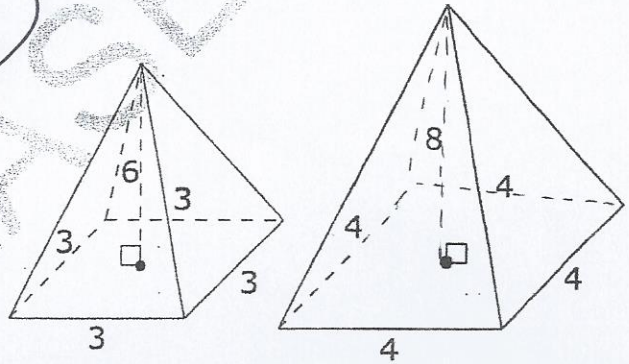
8

4

4   4

4

$$\frac{6}{3} = \frac{8}{4}$$

$$24 = 24 \; \checkmark$$