1. The ratio of children to adults in one section of the theater was 16 to 24. If there were a total of 104 children in the theater how many adults were there?

$$\frac{16 \text{ children}}{24 \text{ adults}} = \frac{104 \text{ children}}{X \text{ adults}}$$

$$16X = 2496$$

$$X = 156 \text{ aduts}$$

2. A quality control employee samples 80 light bulbs from the production floor and finds that 3 of them are defective. If there are 1000 bulbs produced each day, how many of those will be defective?

$$\frac{3 \text{ def}}{80 \text{ bulbs}} = \frac{X \text{ def}}{1000 \text{ bulbs}}$$

$$80X = 3000$$

$$X \approx 37 \text{ bulbs}$$

38 bulbs

1. Use these similar figures to find the
value of x and y to the nearest hundredth.

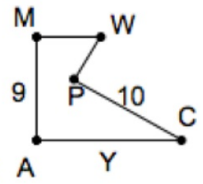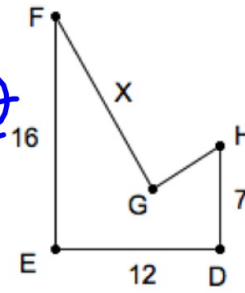$X = \underline{13.\overline{3}}$ $Y = \underline{12}$

$\dfrac{16}{y} = \dfrac{12}{9}$

$9x = 120$

$\dfrac{9x}{9} = \dfrac{120}{9}$

$12y = 144$

$\dfrac{12}{9} = \dfrac{x}{10}$

F

X

16

H

G   7

M   W

9   P   10

C

E   12   D

A   Y

2. Are these two trapezoids similar?

yes

H   12   R

95   110

18   24

85°   70°

K   30   B

N   10   Y

95°   110°

15   20

85   70

Q   25   G
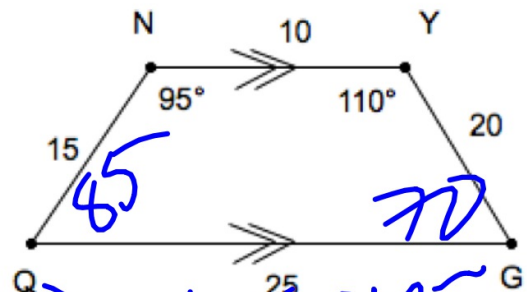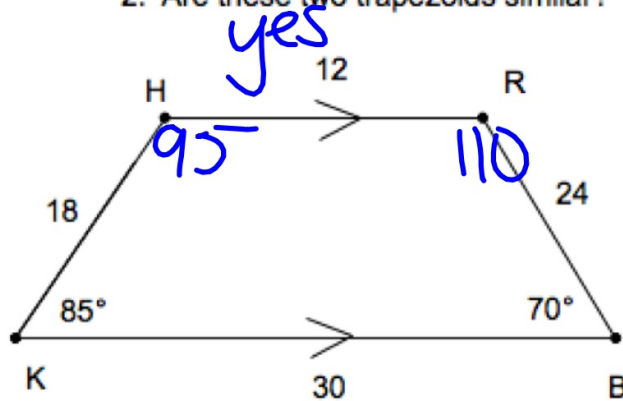
(1) all $\angle s$ are $\cong$

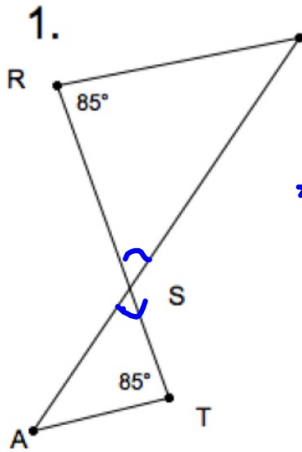(2) $\dfrac{18}{15} = \dfrac{24}{20} = \dfrac{6}{10}$

yes $= \dfrac{30}{25}$
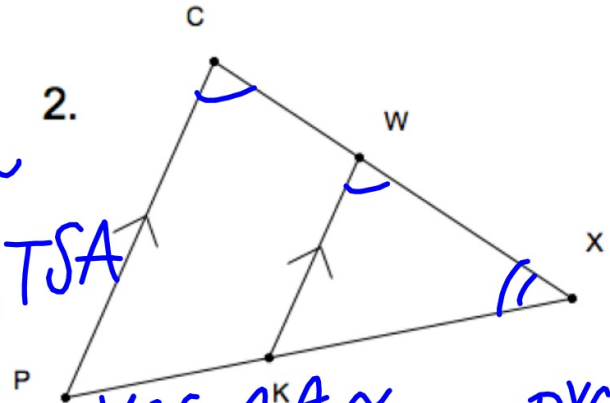
FIGURES ARE NOT DRAWN TO SCALE

Is each pair of triangles similar?
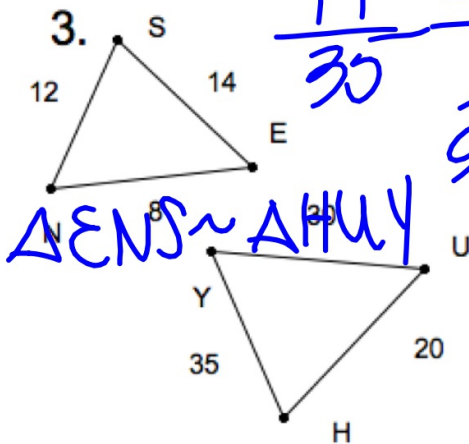
If yes answer the following:
a. Give the postulate or theorem used.
b. Write the similarity statement.
c. Give the similarity ratio if possible.

2.

1.

R 85°
S
85°
Q
A
T

a. yes, AA~
△RSQ ~ △TSA

C
W
X
P
K

yes AA~
△KXW ~ △PXC

3.

yes SSS~

$$\frac{14}{35} = \frac{12}{30} = \frac{8}{20}$$

$$\frac{2}{5}$$

S
12   14
N   8   E
Y
35   20   U
H

△ENS ~ △HUY

4.

SAS~

12   B   3   T
4   9   N
D

$$\frac{12}{9} = \frac{4}{3}$$

△GBD ~ △NBT

$$\frac{9}{15} = \frac{6}{10}$$

yes, SAS~

$\triangle AEB \sim \triangle XEW$

10

A 5 6 15 X 9 6 W 4 B E

U 6 6 12 J 15 M 18 5 G 10 H L

NO.
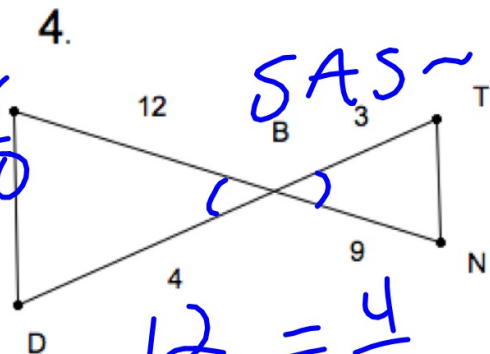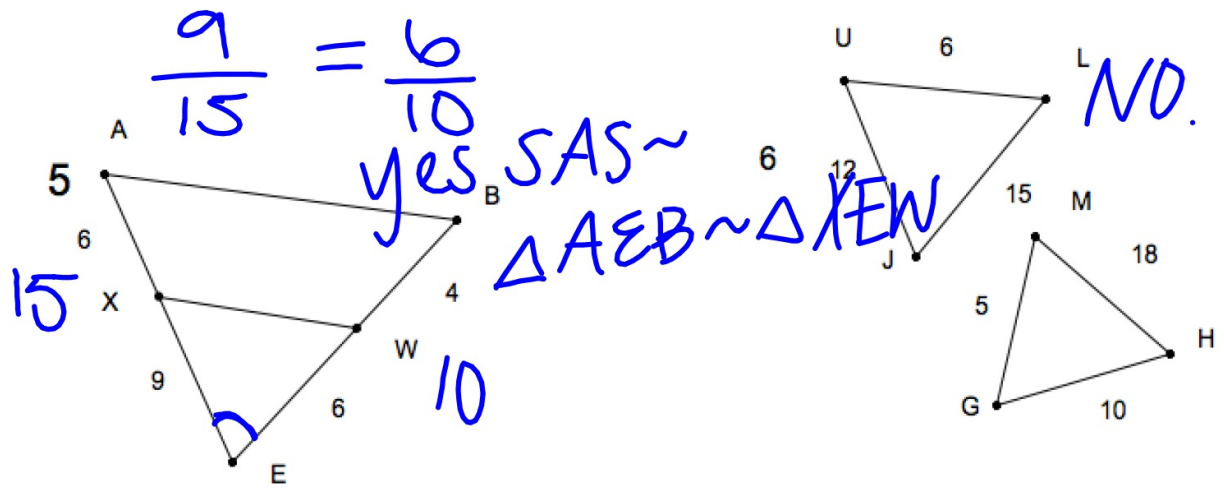
Find the geometric mean of each pair of numbers.

1. 32 and 8   16

2. 4 and 16   8

3. 11 and 7 $\sqrt{77}$

4. 2 and 22 $2\sqrt{11}$

5. 10 and 20 $10\sqrt{2}$

6. 6 and 30 $6\sqrt{5}$

$\sqrt{180}$ 36   5

Use the figure at the right to complete each proportion.

13. $\dfrac{AD}{DG} = \dfrac{BE}{EH}$

14. $\dfrac{CF}{BE} = \dfrac{FI}{EH}$

15. $\dfrac{JA}{JC} = \dfrac{AB}{BC}$

16. $\dfrac{JF}{FE} = \dfrac{D}{DE}$

17. $\dfrac{GH}{HI} = \dfrac{DE}{EF}$

18. $\dfrac{AD}{AG} = \dfrac{BE}{BH}$
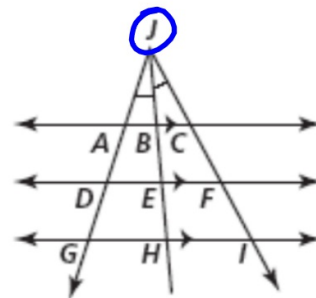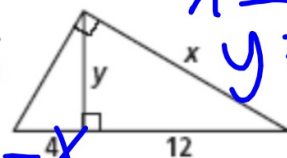

Find the values of the variables.

19.

$\dfrac{9}{y} = \dfrac{y}{12}$

$x = 6$

$y = 6\sqrt{3}$

20.

$x = 8\sqrt{3}$

$y = 4\sqrt{3}$
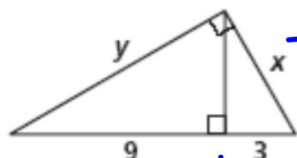
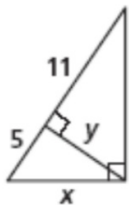$\dfrac{3}{x} = \dfrac{x}{12}$
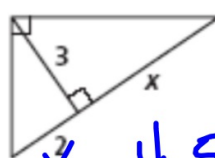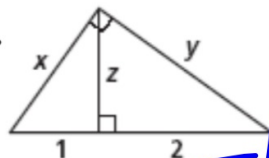
$x = 4.5$

22.

$$\frac{11}{y} = \frac{y}{5}$$

$$x = 4\sqrt{5}$$
$$y = \sqrt{55}$$
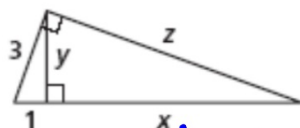
23.

$$x = \sqrt{3}$$
$$y = \sqrt{6}$$
$$z = \sqrt{2}$$

$$\frac{8}{2} = \frac{2}{9}$$
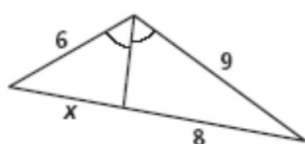$$z^2 = 72$$
$$= 6\sqrt{2}$$

24.

$$\frac{1}{y} = \frac{y}{8} \quad y = 2\sqrt{6}$$

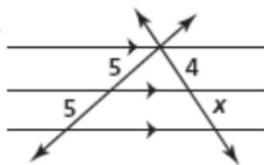$$\frac{1}{3} = \frac{3}{1+x}$$
$$x + 1 = 9$$
$$x = 8$$

25.

$$\frac{6}{x} = \frac{9}{8}$$
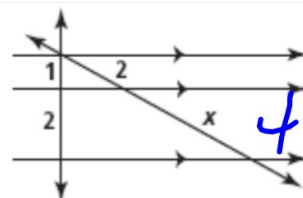
$$\frac{9x}{9} = \frac{48}{9}$$
$$x = 5.33$$

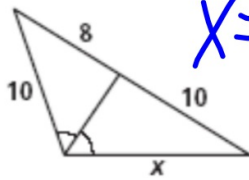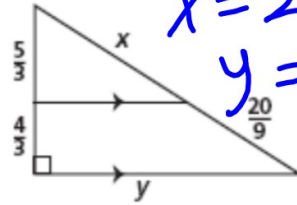**26.**

$$\frac{5}{4} = \frac{5}{x}$$
$$x = 4$$

27.

$$4$$

28.

8
10 10
x

$x = 12.5$

$$\frac{x}{10} = \frac{10}{8}$$

29.

$\frac{5}{3}$
x
$\frac{4}{3}$
$\frac{20}{9}$
y

$x = 25/9$
$y = 4.4$

$$\frac{\frac{5}{3}}{\frac{4}{3}} = \frac{x}{20/9}$$

30.

5
x
4 3

$x = 3.75$

31.

x
├─ 12 ─┤

32.

36 20
x 21
22
y

$x = 37.8$
$y = 39.6$

33.

x, x + 1, 6, 9

$X = 2$

34.

x, x + 4, x − 1, x + 2
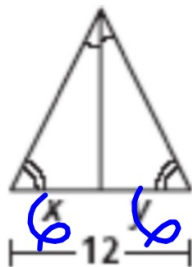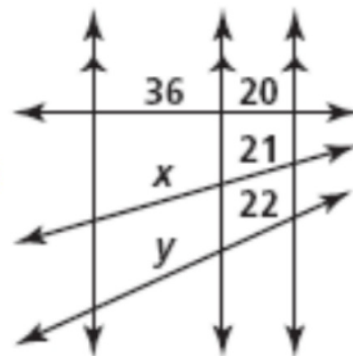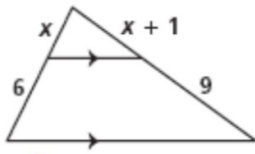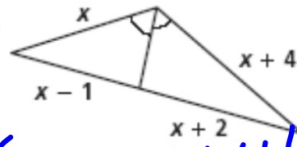
$$\frac{X}{X-1} = \frac{X+4}{X+2}$$

$$X^2 + 2X = X^2 + 3X - 4$$

$$-1X = -4$$

$$X = 4$$

35.

x, 2x − 8, x + 5, x + 8
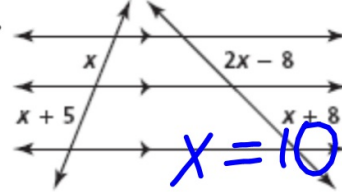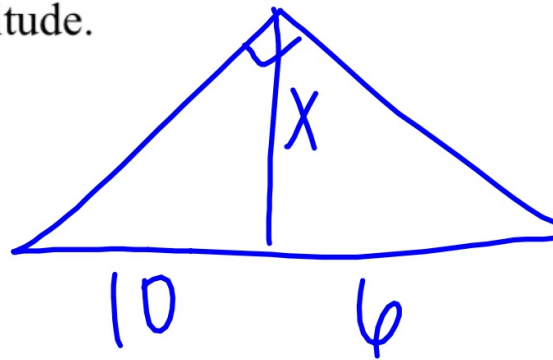
$X = 10$

36. The altitude to the hypotenuse of a right triangle divides the hypotenuse into segments 6 in. and 10 in. long. Find the length h of the altitude.

x, 10, 6

$$\frac{10}{X} = \frac{X}{6}$$

$$X^2 = 60$$

$$X = \sqrt{60}$$

$$4 \cdot 15$$

$$= 2\sqrt{15}$$