In the figure ΔABC ~ ΔPQR, $\overline{BD}$ is an altitude of ΔABC, and
$\overline{QS}$ is an altitude of ΔPQR. Determine whether each
statement is true or false.
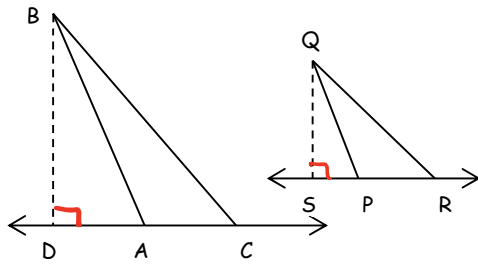
#1) $\dfrac{BD}{QS} = \dfrac{AB}{PQ}$ True   #2) $\dfrac{AD}{PS} = \dfrac{QR}{BC}$ False

#3) $\dfrac{QP}{AB} = \dfrac{BD}{QS}$ False   #4) $\dfrac{QR}{BC} = \dfrac{QS}{BD}$ True

#5) $\dfrac{BD}{QS} = \dfrac{AC}{PR}$ True   #6) $\dfrac{AB}{BD} = \dfrac{PQ}{QS}$ True

Using the figure, ΔABC ~ ΔDEF, $\overline{AR} \cong \overline{RC}$ and $\overline{DS} \cong \overline{SF}$. Find
the value of x.

#7) AC = 20, DF = 12, ES = 5, BR = x

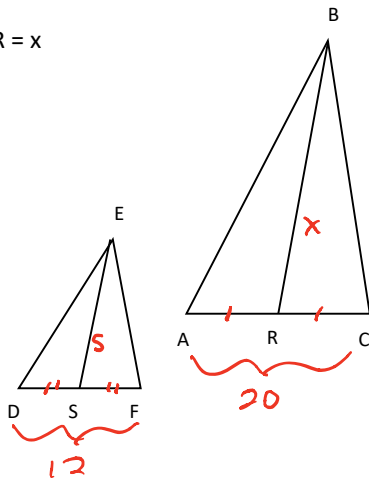$\dfrac{x}{5} = \dfrac{20}{12}$

$x = \dfrac{20(5)}{12}$

$x = \dfrac{100}{12}$

$x = \dfrac{50}{6}$

$x = \dfrac{25}{3}$

20

12

#8) BC = x + 2, BR = x – 5, ES = 6, EF = 16

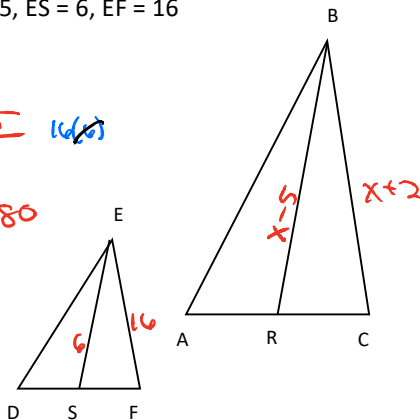$\cancel{16}(6)\ \dfrac{x+2}{\cancel{6}} = \dfrac{x-5}{\cancel{16}}\ 16(6)$
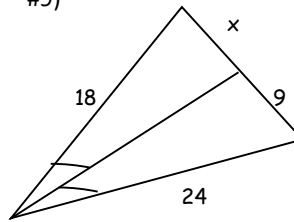
$6x + 12 = 16x - 80$

$6x + 92 = 16x$

$92 = 10x$
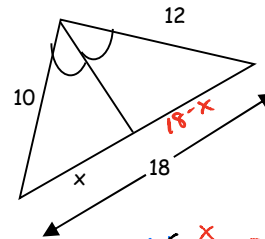
$\dfrac{92}{10} = x$

$\dfrac{46}{5} = x$

#9)

$6\cdot4\ \dfrac{x}{18} = \dfrac{9}{24}\ 6\cdot4$

$4x = 27$

$x = \dfrac{27}{4}$
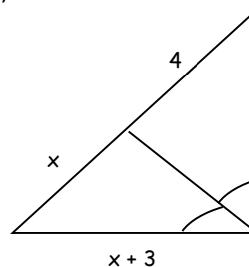
#10)

$12(16)\ \dfrac{x}{16} = \dfrac{18-x}{12}\ 12(16)$

$12x = 180 - 10x$

$22x = 180$

$x = \dfrac{180}{22}$

$x = \dfrac{90}{11}$

#11)

$6(x+3)\ \dfrac{x}{x+3} = \dfrac{4}{6}\ 6(x+3)$
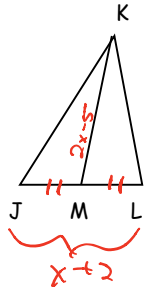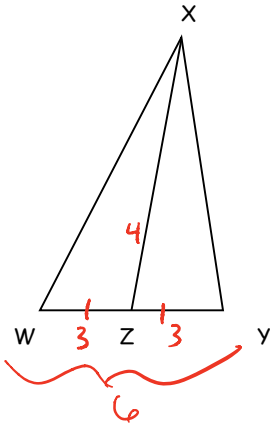
$6x = 4x + 12$

$2x = 12$

$x = 6$

Using the figure, determine the value of x under each set of conditons.

#12) In the figure, ΔWXY ~ ΔJKL, $\overline{XZ}$ and $\overline{KM}$ are medians. If XZ = 4, WZ = 3, JL = x + 2, and KM = 2x − 5, find JM.

X

K

4

2x-5

J   M   L

W   3   Z   3   Y

x+2

6

$$6(4)\frac{2x-5}{4} = \frac{x+2}{6}\ 6(4)$$

$$12x - 30 = 4x + 8$$
$$8x - 30 = 8$$
$$8x = 38$$
$$x = \frac{38}{8}$$
$$x = \frac{19}{4}$$

$$JM = \frac{1}{2}(x+2)$$
$$= \frac{1}{2}\left(\frac{19}{4} + \frac{8}{4}\right)$$
$$= \frac{1}{2}\left(\frac{27}{4}\right)$$
$$JM = \frac{27}{8}$$

#13) In the figure, ΔABC ~ ΔDEF, $\overline{AX}$ and $\overline{DY}$ are altitudes. Find DY.
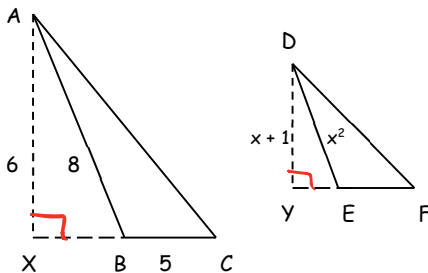
A

D

6   8   x + 1 x^2

X   B   5   C   Y   E   F

$$8(6)\frac{x^2}{8} = \frac{x+1}{6}\ 8(6)$$

$$6x^2 = 8x + 8$$
$$6x^2 - 8x - 8 = 0$$
$$2(3x^2 - 4x - 4) = 0$$
$$2\left[(3x^2 - 6x) + (2x - 4)\right] = 0$$
$$2\left[3x(x-2) + 2(x-2)\right] = 0$$
$$2(x-2)(3x+2) = 0$$

$$x - 2 = 0 \qquad 3x + 2 = 0$$
$$x = 2 \qquad 3x = -2$$
$$x = -\frac{2}{3}$$

$$DY = x + 1$$
$$= (2) + 1$$
$$DY = 3$$

$$DY = x + 1$$
$$= \left(-\frac{2}{3}\right) + \frac{3}{3}$$
$$DY = \frac{1}{3}$$

#14) In the figure, ΔSTU ~ ΔWZY. If the perimeter of ΔSTU is 30 units, find the value of x.
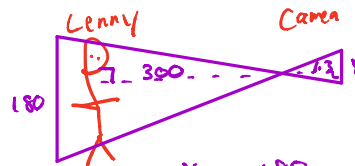
W

S

8   12   2x + 1

U   T   Y   4x -4   Z
4
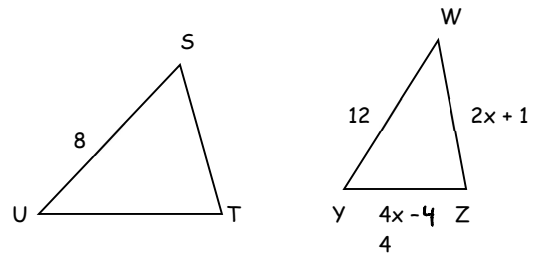
$$\frac{8}{12} = \frac{30}{12 + (2x+1) + (4x-4)}$$

$$3(6x+9)\frac{2}{3} = \frac{30}{6x+9}\ 3(6x+9)$$

$$12x + 18 = 90$$
$$12x = 72$$
$$x = 6$$

#15) Lenny is having his senior portrait taken. Suppose Lenny is 300 cm from a camera lens and the film is 1.3 cm from the lens. If Lenny is 180 cm tall, how tall is his image on the film?

Lenny   Camera

180   300   Y

$$\frac{Y}{1.3} = \frac{180}{300}$$

$$Y = \frac{180(1.3)}{300}$$

$$Y = \frac{234 \div 6}{300 \div 6}$$

$$Y = \frac{39}{50}\ cm$$

#1) True   #2) False   #3) False
#4) True   #5) True   #6) True
#7) $\frac{25}{3}$ #8) $\frac{46}{5} = 9.2$ #9) $\frac{27}{4} = 6.75$
#10) $\frac{90}{11}$ #11) 6   #12) $\frac{19}{4} = 4.75$ $\frac{27}{8}$
#13) $\frac{1}{3}$ or 3   #14) 6   #15) $\frac{39}{50} = 0.78\ cm$