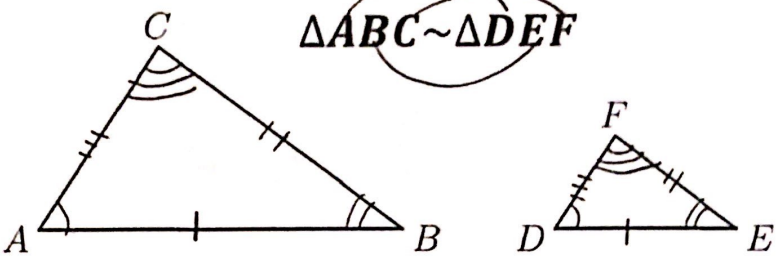
Unit 6 Lesson 7 Notes Solving Similar Triangles Name: Key

Dilations produce similar triangles. In similar triangles,

- corresponding angle measures are congruent (NOT affected by the scale factor)
- corresponding sides are proportional (set up ratios/fractions of corresponding sides)

$\Delta ABC \sim \Delta DEF$

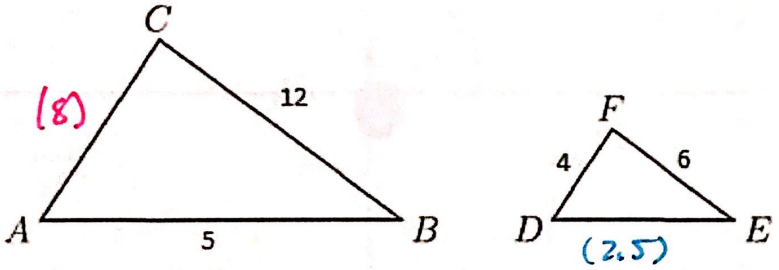


Identify the corresponding congruent angle pairs.

$\angle A \cong \angle D$
$\angle B \cong \angle E$
$\angle C \cong \angle F$

Write a proportion for the corresponding sides.

$$\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF}$$



Substitute the lengths of the sides and solve for the missing sides using cross multiplication.

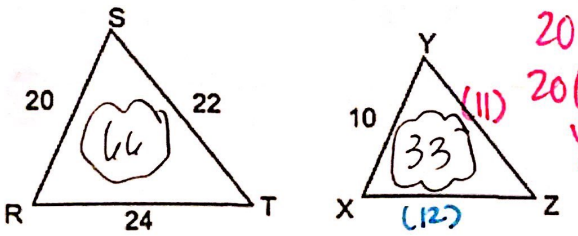
$$\frac{5}{DE} = \frac{12}{6} = \frac{AC}{4}$$

$$\frac{30}{12} = \frac{12(DE)}{12}$$
$2.5 = DE$

$$\frac{48}{6} = \frac{6(AC)}{6}$$
$AC = 8$

You try!

1. If $\Delta RST \sim \Delta XYZ$, find the perimeter of the smaller triangle. 33



$20(YZ) = 10(22)$
$20(YZ) = 220$
$YZ = 11$

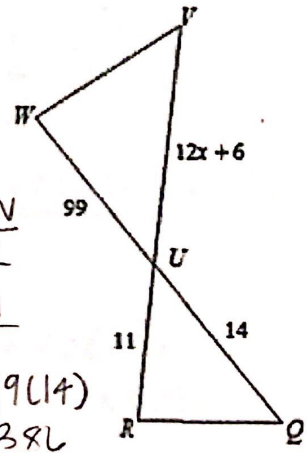
$$\frac{RS}{XY} = \frac{ST}{YZ} = \frac{RT}{XZ}$$

$$\frac{20}{10} = \frac{22}{YZ} = \frac{24}{XZ}$$

$20(XZ) = 10(24)$
$20(XZ) = 240$
$XZ = 12$

*Perimeter of ΔRST proportional to Perimeter of ΔXYZ

2. $\Delta UVW \sim \Delta UQR$
Solve for x.



$$\frac{UV}{UQ} = \frac{VW}{QR} = \frac{UW}{UR}$$

$$\frac{12x+6}{14} = \frac{VW}{QR} = \frac{99}{11}$$

$11(12x+6) = 99(14)$
$132x + 66 = 1386$
$132x = 1320$
$x = 10$

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SIMILAR TRIANGLES
Scavenger Hunt!

Name: Key

Date: _____ Per: _____

1

figure a : figure b

15 : 9 (5/3)

35 : 21 (5/3)

40 : 24 (5/3)

5:3

2

figure b : figure a

4 : 16 (1/4)

6 : 24 (1/4)

8 : 32 (1/4)

1:4

3

$$\frac{9}{4x-13} = \frac{6}{10}$$

$90 = 6(4x-13)$

$90 = 24x - 78$

$168 = 24x$

$x = 7$

7

4

$$\frac{x+2}{6} = \frac{x+7}{8}$$

$8(x+2) = 6(x+7)$

$8x+16 = 6x+42$

$2x = 26$

$x = 13$

13

5

$$\frac{20}{48} = \frac{3x-2}{7x-3}$$

$20(7x-3) = 48(3x-2)$

$140x - 60 = 144x - 96$

$-4x = -36$

$x = 9$

9

6

$$\frac{3x+2}{10} = \frac{5x+1}{16}$$

$DE = 5(11)+1$
$= 55+1$
$= 56$

$16(3x+2) = 10(5x+1)$

$48x+32 = 50x+10$

$-2x+32 = 10$

$-2x = -22$

$x = 11$

56

7

$$\frac{36}{5x+1} = \frac{63}{11x-5}$$

$ST = 5(3)+1$
$= 16$

$36(11x-5) = 63(5x+1)$

$396x - 180 = 315x + 63$

$81x = 243$

$x = 3$

16

8

$$\frac{x+11}{3x-9} = \frac{45}{72}$$

$72(x+11) = 45(3x-9)$

$72x + 792 = 135x - 405$

$-63x = -1197$

$x = 19$

$61 = 19 + 11 + 3(19) - 9 = 78$

78

9

$$\frac{39}{65} = \frac{4x-3}{4x-3+30}$$

$QT = 4(12)-3$
$= 45$

$39(4x-3+30) = 65(4x-3)$

$156x - 117 + 1170 = 260x - 195$

$156x + 1053 = 260x - 195$

$-104x = -1248$

$x = 12$

45

10

$$\frac{12}{x+6} = \frac{32}{3x+11}$$

$12(3x+11) = 32(x+6)$

$36x + 132 = 32x + 192$

$4x = 60$

$x = 15$

$LM = 15+6$
$= 21$

21

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$\Delta BKY \sim \Delta TZY$

11

$\frac{18}{30} = \frac{2x+7}{6x+1}$

$18(6x+1) = 30(2x+7)$

$108x+18 = 60x+210$

$48x = 192$

$x = 4$

$SN = 6(4)+1$

$= 25$

25

12

$\frac{KY}{40} = \frac{72}{45}$

$45x = 2880$

$x = 64$

$208 - 72 - 64$

$KB = 72$

$\frac{ZT}{72} = \frac{40}{64}$

$64ZT = 2880$

$ZT = 45$

Perimeter $= 45+45+40$

130

13

$72+52+68 = 192$

$\frac{192}{144} = 4/3$

$1cm = 4/3$ (Right)

$MN = 4/3(xz)$

$68 = 4/3(xz)$

$xz = 51$

51

14

$\frac{\Delta NPQ}{\Delta RSQ}$ $\frac{7x+2}{10x-4} = \frac{21}{28}$

$28(7x+2) = 21(10x-4)$

$196x+56 = 210x-84$

$-14x = -140$

$x = 10$

$\Delta NPQ = 7(10)+2 = 72$

72

15

$\frac{SQT}{PQR} \Rightarrow \frac{135}{171} = \frac{2x-4}{3x-13}$

$135(3x-13) = 171(2x-4)$

$405x - 1755 = 342x - 684$

$63x = 1071$

$x = 17$

$PQ = 2(17)-4 + 17-9 = 38$

38

16

$3x+9 = 4/5(4x+4)$

$3x+9 = 3.2x + 3.2$

$-.2x = -5.8$

$x = 29$

$\Delta CFH = 36+28+32 = 96$

96

17

$5x-14+84+25 = 180$

$5x+95 = 180$

$5x = 85$

$x = 17$

17

18

$4x+1+63+24 = 180$

$4x+88 = 180$

$4x = 92$

$x = 23$

23

19

$8x-37+42+2x-5 = 180$

$10x = 180$

$x = 18$

$\angle B = 8(18)-37$

$= 107$

107°

20

$2x-2+8x-7+3x-6 = 180$

$13x-15 = 180$

$13x = 195$

$x = 15$

$\angle T = 3(15)-6$

$= 39$

39°

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