

Formal Geometry Assignments

Chapter 7: Proportions and Similarity (~)

Day	Date	Assignment (Due the next class meeting)
Tuesday Wednesday	1/9/24 (A) 1/10/24 (B)	Proportions Worksheet 7.2 p.507-510 #12, 13, 18-24 EVEN, 28, 34, 35, 38-41 (SLO Baseline in Class)
Thursday Friday	1/11/24 (A) 1/12/24 (B)	7.3 p.516-517 #9, 11, 13, 14, 16 – 22 7.4 p. 527 #13, 14, 18, 19, 23 7.4 Extra Problems #1 – 6
Tuesday Wednesday	1/16/24 (A) 1/17/24 (B)	Winter Break factoring bonus worksheet due TODAY! 7.5 p.539-542 #12-20 even, 24, 34 – 38, 40, 48, 57 7.5 Extra Problems
Thursday Friday	1/18/24 (A) 1/19/24 (B)	7.6 p. 548-549 #13, 20-23 7.6 Worksheet
Monday Tuesday	1/22/24 (A) 1/23/24 (B)	Chapter 7 Review Worksheet Dilations Worksheet (7.1)
Wednesday Thursday	1/24/24 (A) 1/25/24 (B)	Ch 7 Review Day 8.1 Notes in Class
Friday Monday	1/26/24 (A) 1/29/24 (B)	CHAPTER 7 TEST HW: Algebra Review Wk

*Each problem will be worth 1 point unless specified.

*Corrections are expected to be done to earn back points missed for each assignment.

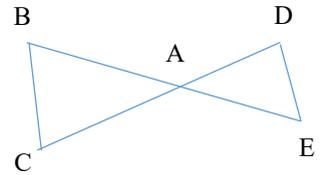
*Class webpage: www.washoeschools.net/drhsmath

Students with no late or missing assignments at the end of the semester will be rewarded with a pizza party. Students with no missing assignments will get a 2% grade increase at the end of the semester.

7.4 Extra Problems

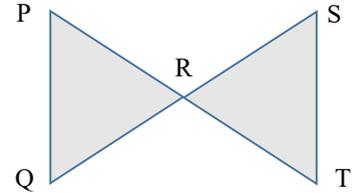
1)

Given: $\overline{CB} \parallel \overline{ED}$
 Prove: $\triangle ABC \sim \triangle AED$



2)

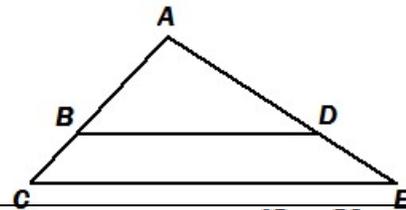
Given: $\angle P \cong \angle S$
 Prove: $\triangle PRQ \sim \triangle SRT$



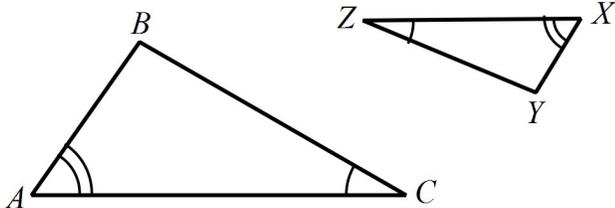
3)

Given: $\overline{BD} \parallel \overline{CE}$.

Prove: $AB \cdot CE = AC \cdot BD$



4) The triangles shown are similar. Which of the following is **not** a correct statement?



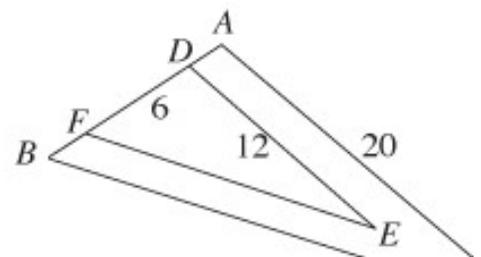
A) $\frac{AB}{XY} = \frac{BC}{YZ}$

B) $\frac{BC}{YZ} = \frac{AC}{XY}$

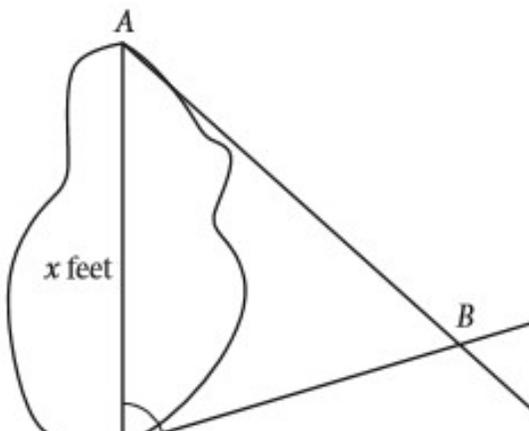
C) $\frac{CA}{ZX} = \frac{BA}{YX}$

D) $\frac{AC}{XZ} = \frac{AB}{XY}$

5) In the figure, $\angle ABC \cong \angle DFE$, $\angle BAC \cong \angle FDE$, $\overline{AD} \cong \overline{FB}$, and distances in centimeters are shown. What is the length of \overline{AD} , in centimeters?



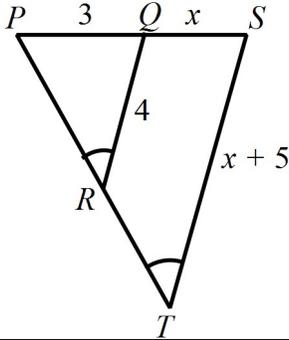
6)



A summer camp counselor wants to find a line segment across a lake as represented in the sketch above. The lengths represented by AB , EB , CD on the sketch were determined to be 18 feet, 1400 feet, 700 feet, and 800 feet, respectively. Segments AC and DE intersect at B , and $\angle CDR$ have the same measure. What

7.5 Extra Problems

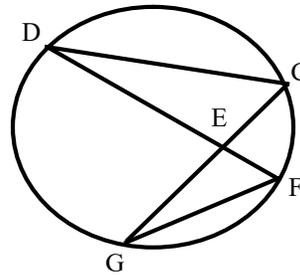
1) Find the length of \overline{PS} in the diagram below.



- A) $PS = 5$
- B) $PS = 6$
- C) $PS = 8$
- D) $PS = 18$

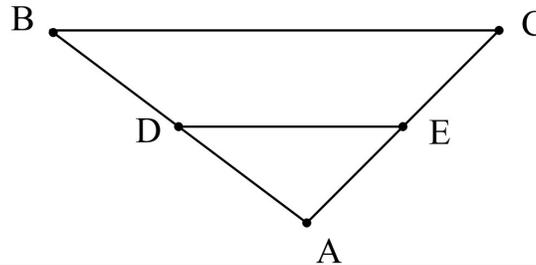
2) Given: $\angle D \cong \angle G$

Prove: $\frac{CD}{FG} = \frac{DE}{EG}$



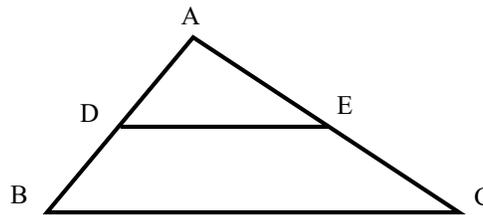
3) Given: $\overline{DE} \parallel \overline{BC}$.

Prove: $AD \cdot EC = AE \cdot DB$

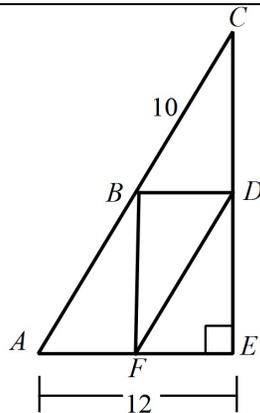


4) Given: $\triangle ADE \sim \triangle ABC$

Prove: $\frac{AD}{DB} = \frac{AE}{EC}$



5) In the diagram to the right \overline{BD} , \overline{DF} , and \overline{BF} are midsegments and $BC = 10$ and $AE = 12$. Compare the perimeters of $\triangle CDB$ and $\triangle DEF$, then choose the statement below that is true.



- | | |
|---|--------------------------|
| A) The perimeter of $\triangle CDB$ is greater. | B) A relat cannot determ |
| C) The perimeter of $\triangle DEF$ is | D) The pe |

Select Extra Problem Answers:

7.4: 4) B 5) 2 6) 1600 ft.

7.5: 1) B 5) D

Ratio: a comparison of two quantities using division

- The ratio of a to b can be expressed as $\frac{a}{b}$ or $a:b$ where b is not zero.
- A ratio in which the denominator is 1 is called a “unit ratio.”

1: The ratio of football players to high schools in Montgomery County is 546: 26. What is the ratio of football players to high schools written as a unit ratio?

2: In a triangle, the ratio of the measures of three sides is 4: 6: 9, and its perimeter is 285 inches. Find the measures of the three sides of the triangle.

3: The ratio of the measures of the three angles of a triangle is 2: 3: 5. Find the measures of the angles.

Proportion: an equation stating that two ratios are equal

Property of Proportions: also known as “Cross Multiplication”

- For any numbers a, b, c, d , if $\frac{a}{b} = \frac{c}{d}$ then $ad = bc$ ($b \neq 0, d \neq 0$).

For #4 – 5: Solve each proportion.

$$4) \quad \frac{2x+3}{3} = \frac{6}{x-1}$$

$$5) \quad \frac{x^2+4x+4}{40} = \frac{x+2}{10}$$

Solve each situation.

The perimeter of a polygon is the sum of all of the sides.

The area of a rectangle is the length times the width.

6) The perimeter of a rectangle is 196 feet. The ratio of the length to the width is 4:3. Find the area of the rectangle

7) The dimension of a rectangle are y and $y^2 + 1$ and the perimeter of the rectangle is 14 units. Find the ratio of the longer side of the rectangle to the shorter side.

ANSWERS:

1) 21:1 2) 60, 90, 135 3) 36 degrees, 54 degrees, 90 degrees

$$4) x = -\frac{7}{2}; x = 3$$

$$5) x = 2; x = -2$$

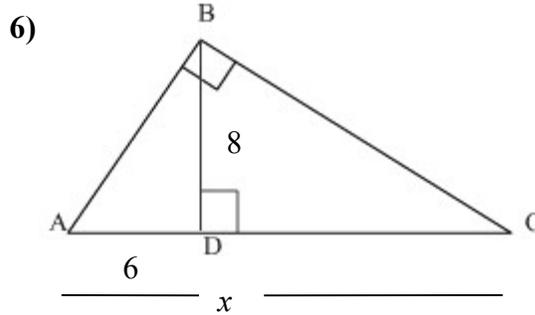
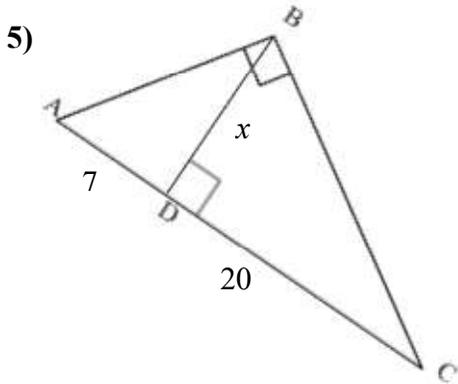
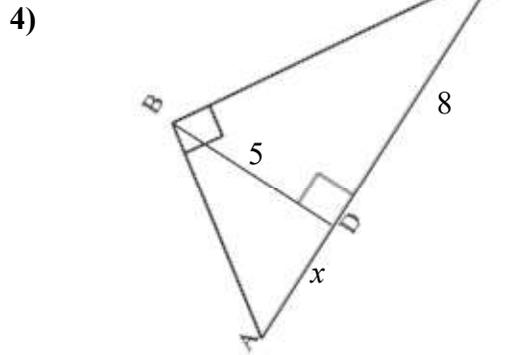
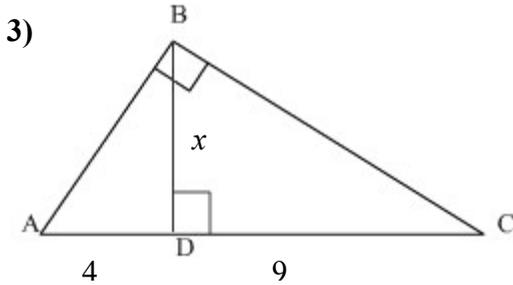
$$6) 2352 \text{ ft}^2$$

$$7) 5:2$$

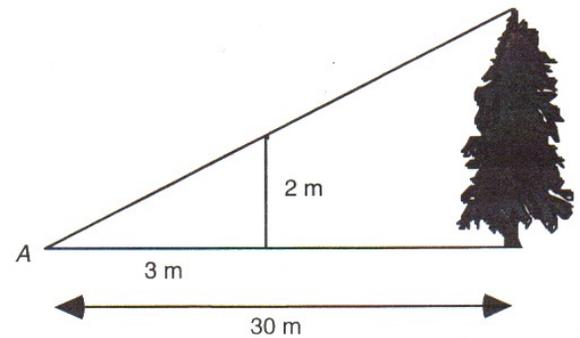
1) Two triangles are similar with a scale factor of 2:3. Find the area of the large triangle if the small triangle has an area of 52 cm^2 .

2) Two triangles are similar. The smaller triangle has a perimeter of 40, and the larger triangle has a perimeter of 50. Find the ratio of the area of the small triangle to the area of the large triangle.

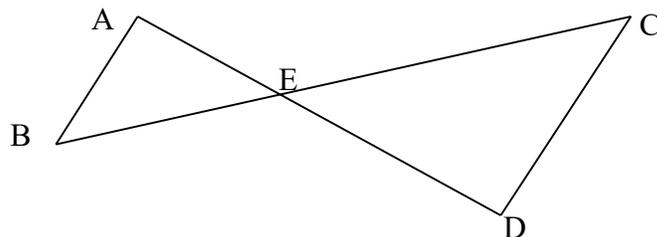
For #3 – 10, solve for x . Exact Answers only. Simplify Radicals



7) A tree casts a shadow of 30 m at the same time of day that a boy with a height of 2 m casts a shadow that is 3 m long. Find the height of the tree.

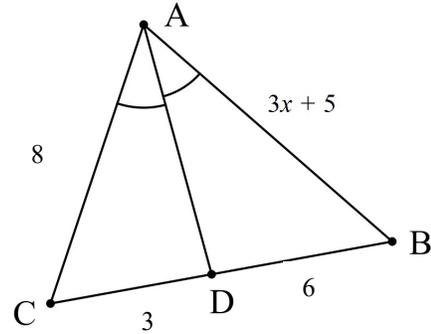


8) Given: $AB \parallel CD$
 Prove: $\triangle ABE \sim \triangle DCE$

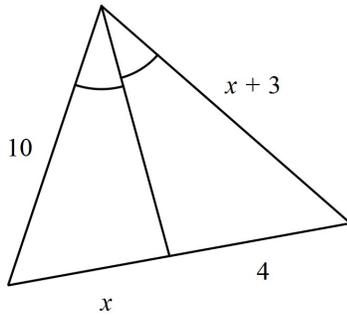


9) Two similar triangles have areas of 27 and 48. If the smaller triangle has a perimeter of 18, find the perimeter of the larger triangle.

10) Find the perimeter of $\triangle ABC$.



11) Find x .



For #12-14: Factor Completely

12) $-7x^3 + 28x$

13) $20x^5 - 45x^3$

14) $-7x^3 - 28x$

Answers

1) 117 cm^2

2) $16 : 25$

3) 6

4) $\frac{25}{8}$

5) $2\sqrt{35}$

6) $\frac{50}{3}$

7) $20 m$

8) Given,

$\angle A \cong \angle D$ and $\angle B \cong \angle C$ (If 2 lines are //, then alt int \angle s are congruent)

$\triangle ABE \sim \triangle DCE$ by AA.

9) 24

10) 33 units

11) 5

12) $-7x(x + 2)(x - 2)$

13) $5x^3(2x + 3)(2x - 3)$

14) $-7x(x^2 + 4)$

SIMPLIFY:

1. $\sqrt{72}$

2. $\sqrt{200}$

3. $\sqrt{27}$

4. $5\sqrt{18}$

5. $\sqrt{3^2 + 4^2}$

6. $\sqrt{4 + 9}$

7. $\sqrt{5^2 + 12^2}$

8. $\sqrt{49 \cdot 3}$

9. $6\sqrt{24}$

10. $\frac{1}{\sqrt{2}}$

11. $\frac{1}{\sqrt{5}}$

12. $\frac{6}{\sqrt{3}}$

13. $4\sqrt{3} + 7\sqrt{3}$

14. $\sqrt{12} + \sqrt{27}$

15. $7\sqrt{2} + \sqrt{3} + 6\sqrt{3} + \sqrt{2}$

16. $\sqrt{72} + \sqrt{75} - \sqrt{48}$

For #17-29: Solve each equation. Exact answers only! (NO decimals)

17. $x^2 = 25$

18. $x^2 = 169$

19. $x^2 = 12$

20. $x^2 + 16 = 25$

21. $12^2 + x^2 = 13^2$

22. $x^2 + (3\sqrt{3})^2 = 36$

23. $x^2 = (5\sqrt{3})^2 + (\sqrt{5})^2$

24. $9x^2 - 18x - 16 = 0$

25. $9x^2 - 216 - 18x = 0$

26. $6x^2 - 15 = 13x$

27. $-6x^2 - 30x + 216 = 0$

28. $3x^2 + 5x - 7 = x^2 + 8x + 28$

29. $\frac{7}{x+1} = \frac{2x+4}{3x-3}$

Answers:

1) $6\sqrt{2}$

2) $10\sqrt{2}$

3) $3\sqrt{3}$

4) $15\sqrt{2}$

5) 5

6) $\sqrt{13}$

7) 13

8) $7\sqrt{3}$

9) $12\sqrt{6}$

10) $\frac{\sqrt{2}}{2}$

11) $\frac{\sqrt{5}}{5}$

12) $2\sqrt{3}$

13) $11\sqrt{3}$

14) $5\sqrt{3}$

15) $8\sqrt{2} + 7\sqrt{3}$

16) $6\sqrt{2} + \sqrt{3}$

17) 5, -5

18) 13, -13

19) $\pm 2\sqrt{3}$

20) 3, -3

21) 5, -5

22) 3, -3

23) $\pm 4\sqrt{5}$

24) $-\frac{2}{3}, \frac{8}{3}$

25) 6, -4

26) $-\frac{5}{6}, 3$

27) -9, 428) $-\frac{7}{2}, 5$

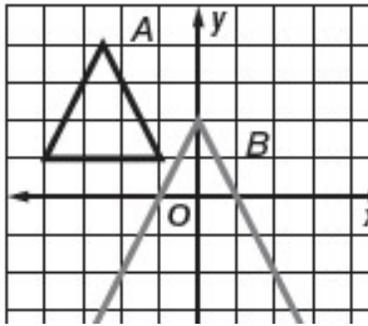
29) $\frac{5}{2}, 5$

Formal Geometry

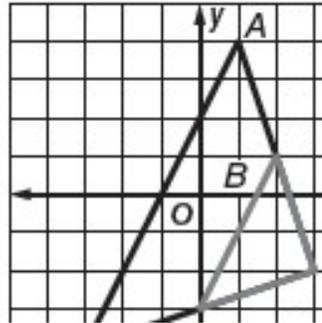
Dilations (7.1) Worksheet Show all work on your own paper!

For #1 – 2: Determine whether the dilation from A to B is an *enlargement* or a *reduction*. Then find the scale factor of the dilation.

1)



2)



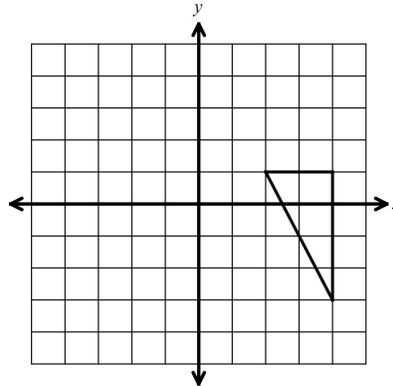
3) Find the scale factor of the dilation described below (note: this dilation is not centered at the origin.) Also, compare the image and pre-image by graphing both. What do you notice?

$P(-3, 1), Q(-1, 1), R(-1, -3);$ and $P'(-1, 4), Q'(3, 4), R'(3, -4)$

4) Given $\triangle ABC$ with $A(3, -4)$ and perimeter of 30. $\triangle ABC$ is dilated so that the perimeter of $\triangle A'B'C'$ is 10, and the dilation is centered at the origin. What are the coordinates of A' ? **Explain your reasoning.**

5) Apply the dilation $D: (x, y) \rightarrow (4x, 4y)$ to the triangle given below. Which of the following is the perimeter of the image?

- A. 41.9 units
- B. 40.5 units
- C. 20.5 units
- D. 9.2 units



6) $MNOP$ is a dilation of $ABCD$, and the scale factor of the dilation is $3:2$. If the perimeter of $ABCD$ is 18, then what is the perimeter of $MNOP$?

For #7 – 8: Graph the image of each polygon with the given vertices after a dilation centered at the origin with the given scale factor.

7) $Q(-1, -1), R(0, 2), S(2, 1); r = -2$

8) $A(1, 1), C(2, 3), D(4, 2), E(3, 1); r = 0.5$

For #9 -10: Find the coordinates of the image of each polygon with the given vertices after a dilation centered at the origin with the given scale factor (k), and then find the perimeter of the image.

9) $S(0,0), T(-4, 0), V(-8, -8); k = 1.25$

10) $D(4,4), F(0, 0), G(8,0); k = 0.75$

For #11-12: Factor completely

11) $3x^3 - 18x$

12) $-2x^3 + 18x$

Answers:

- 1) Enlargement, 2:1 2) Reduction, 1:2 3) 2:1; the triangles have the same shape but different size (are similar triangles)
4) $(1, -\frac{4}{3})$ A comparison of the perimeters shows a scale factor of $\frac{1}{3}$, and thus the image coordinates are $\frac{1}{3}$ of the pre-image coordinates, because the dilation is centered at the origin. 5) A
6) 27 7) Graph with $Q'(2,2); R'(0,-4); S'(-4,-2)$ 8) Graph with $A'(0.5,0.5); C'(1,1.5); D'(2,1); E'(1.5,0.5)$
9) $S'(0,0), T'(-5,0), V'(-10,-10), P \approx 30.3 u$ 10) $D'(3,3), F'(0,0), G'(6,0), P \approx 14.5 u$
11) $3x(x^2 - 6)$ 12) $-2x(x + 3)(x - 3)$