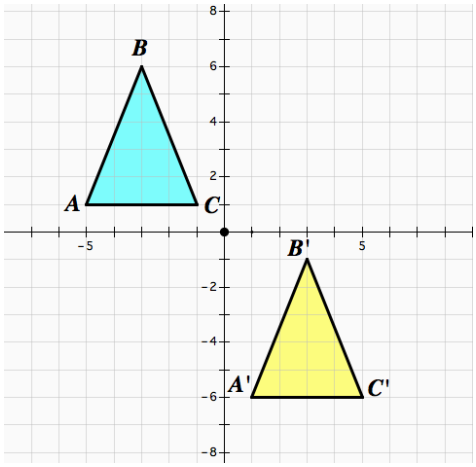
Day 8 Homework Part 1

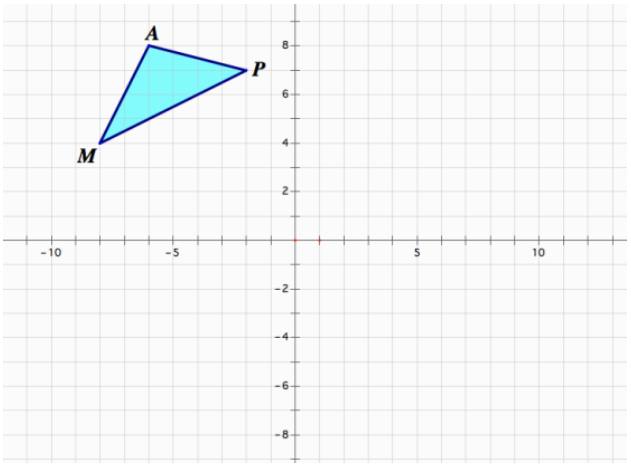
HW Directions: The following problems deal with congruency and rigid motion. The term "rigid motion" is also known as "isometry" or "congruence transformations."

1. In the diagram at the right, a transformation has occurred on ΔABC.
   a) Describe a transformation that created image $\Delta A'B'C'$ from ΔABC.



   b) Is ΔABC congruent to $\Delta A'B'C'$? _____ Explain.

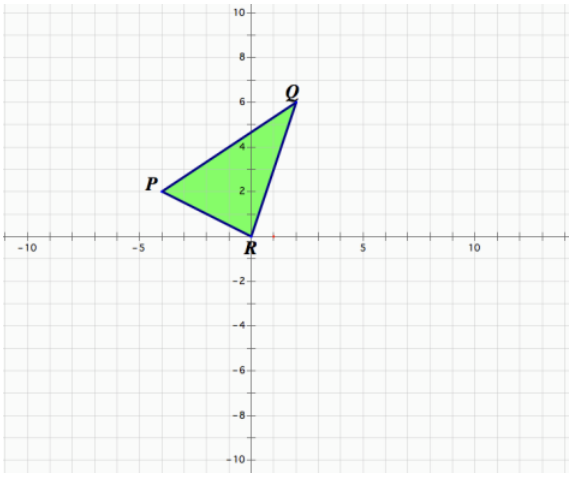
2. The vertices of ΔMAP are M(-8, 4), A(-6, 8) and P(-2, 7).
   The vertices of $\Delta M'A'P'$ are M′(8, -4), A′(6, -8) and P′(2, -7).
   a) Plot $\Delta M'A'P'$.



   b) Verify that the triangles are congruent (using a ruler or distance formula and protractor).

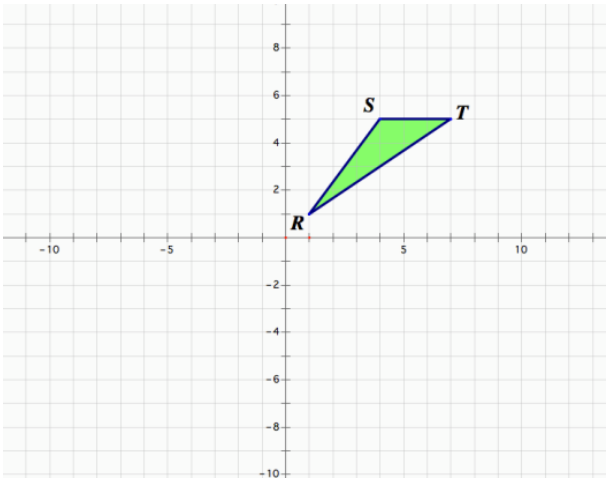
   c) Describe a rigid motion that can be used to M′A′P′

3. Given ΔPQR with P(-4, 2), Q(2, 6) and R(0, 0) is congruent to ΔSTR with S(2, -4), T(6, 2) and R(0, 0).
   a) Plot ΔSTR.



   b) Describe a rigid motion which can be used to verify the triangles are congruent.

4. Given ΔRST with R(1, 1), S(4, 5) and T(7, 5).



a) Plot the reflection of ΔRST in the y-axis and label it $\Delta R'S'T'$.

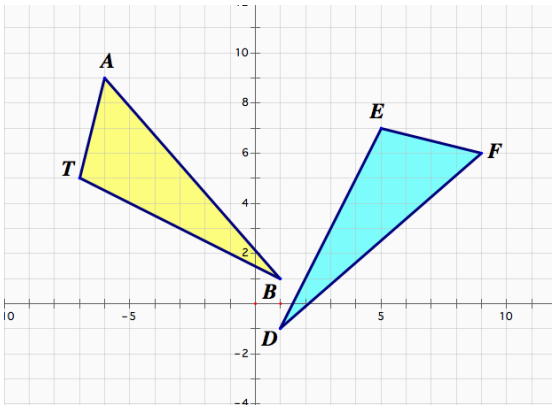
b) Is ΔRST congruent to $\Delta R'S'T'$? _____ Explain.

c) Plot the image of $\Delta R'S'T'$ under the translation (x, y) → (x + 4, y – 8). Label the image of $\Delta R''S''T''$.

d) Is ΔR′S′T′ congruent to $\Delta R''S''T''$? _____ Explain.

e) Is ΔRST congruent to $\Delta R''S''T''$? _____ Explain.

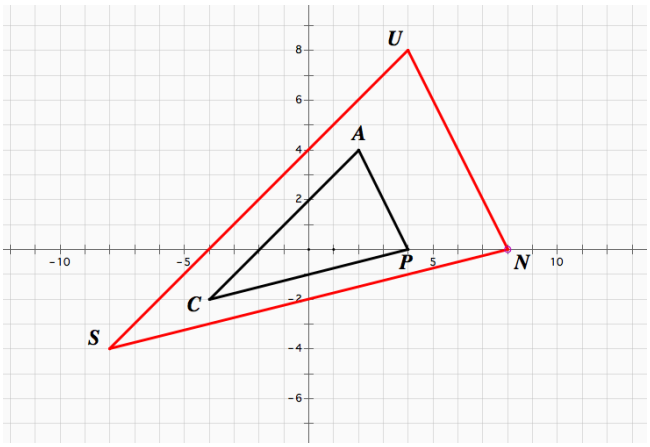
5. Given ΔDFE with D(1, -1), F(9, 6) and E(5,7) and ΔBAT with B(1, 1), A(-6, 9) and T(-7, 5).



a) Describe a transformation that will yield ΔBAT as the image of ΔDFE.

b) Is ΔBAT congruent to ΔDFE? _____ Explain.

6. Given ΔCAP with C(-4, -2), A(2, 4) and P(4, 0) and ΔSUN with S(-8, -4), U(4, 8) and N(8, 0).



a) Plot ΔCAP and ΔSUN.

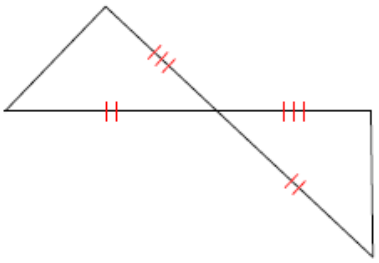
b) Describe a transformation that will yield ΔSUN as the image of ΔCAP.

c) Is ΔCAP congruent to ΔSUN? _____ Explain.

Day 8 Homework Part 2 and Day 9 Homework Part 1

State if the two triangles are congruent. If they are, state how you know.

1)



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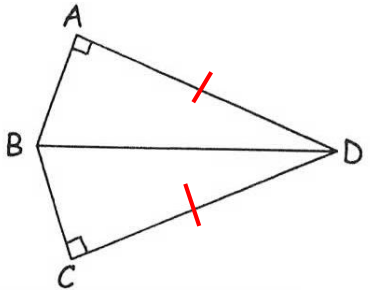
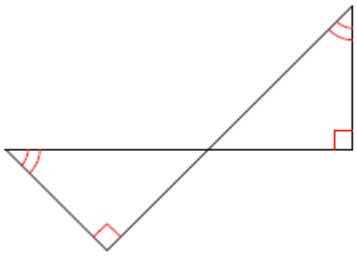


3)



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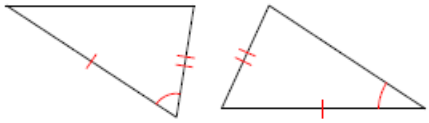

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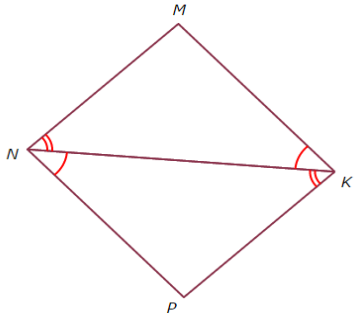
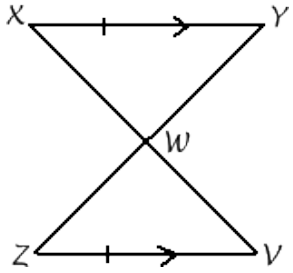
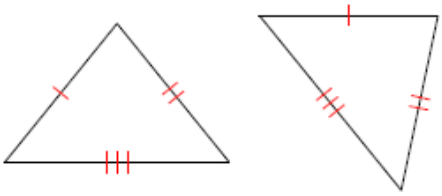


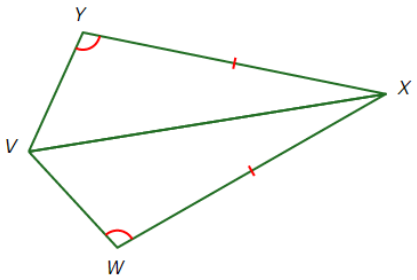
6)



7)



8)



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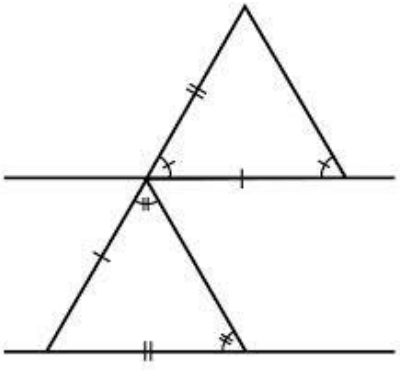

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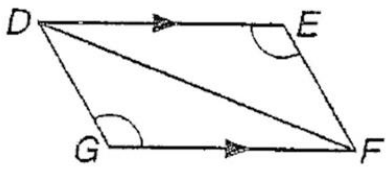

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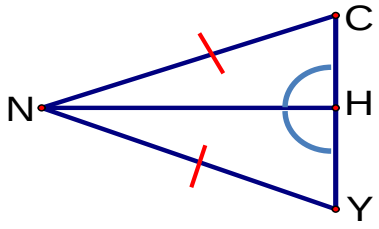

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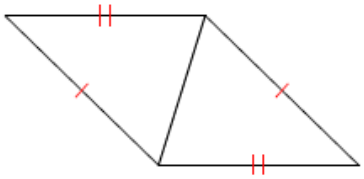

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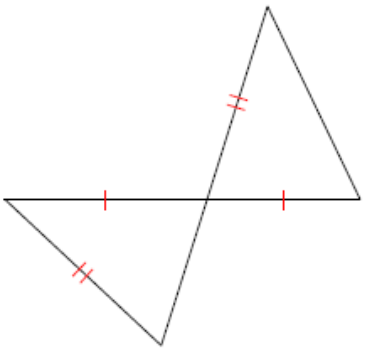

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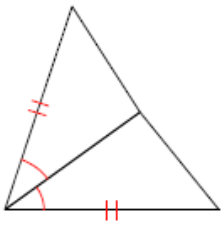

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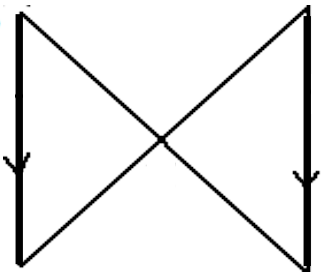

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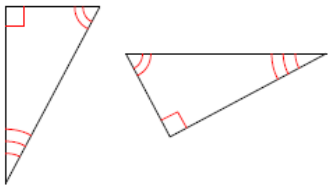

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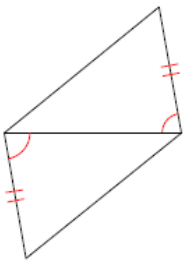

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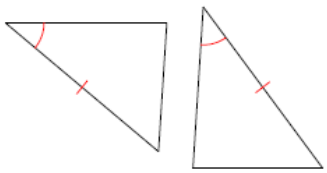

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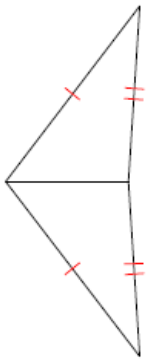

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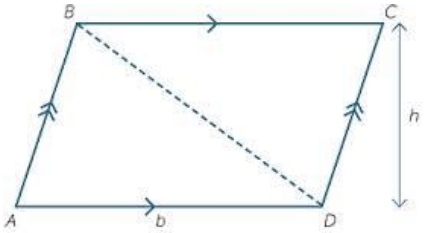
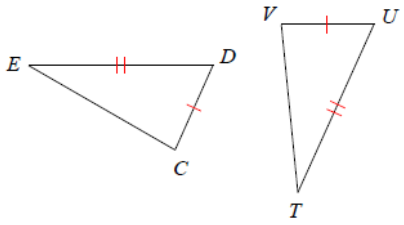
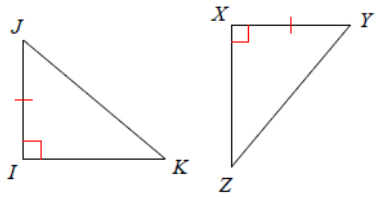


State what additional information is required in order to know that the triangles are congruent for the reason given.

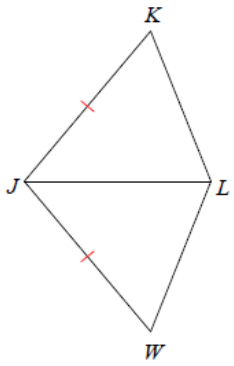
21) SSS



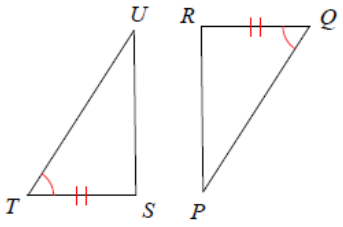
22) SAS



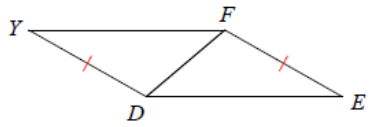
23) SSS



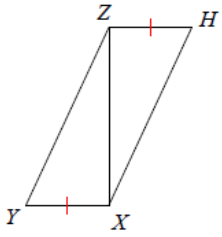
24) SAS



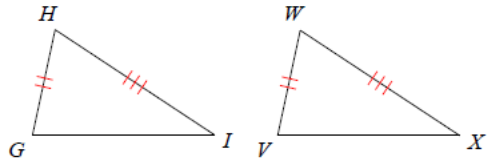
25) SSS



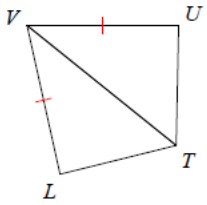
26) SSS



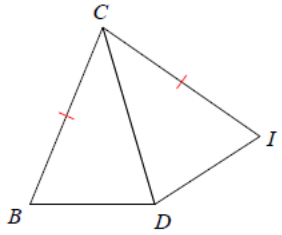
27) SSS



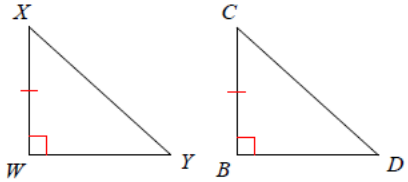
28) SSS



29) SAS



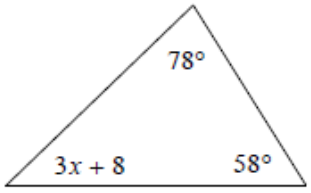
30) SAS



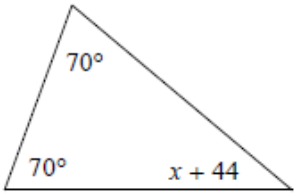
Day 9 Homework Part 2

Solve for the missing value.

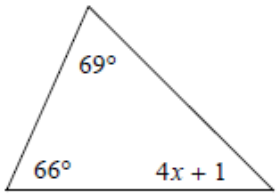
21)



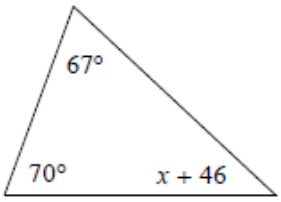
22)



23)



24)



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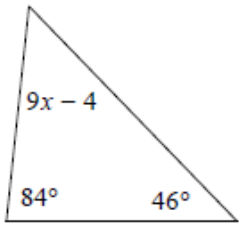

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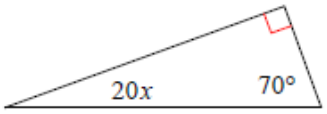
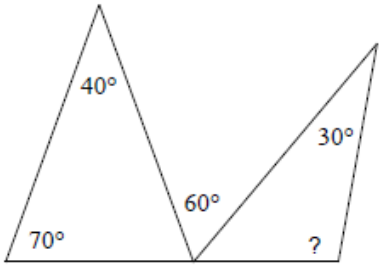


27)



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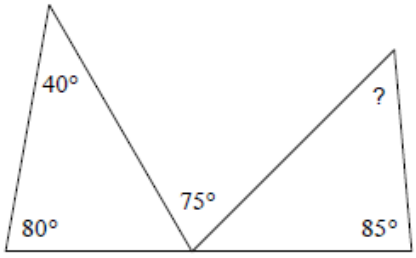
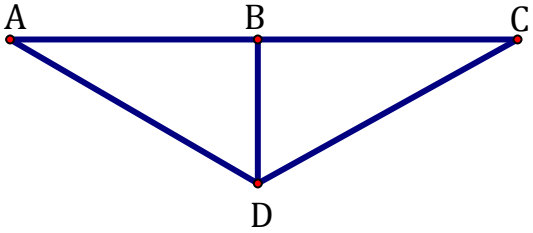
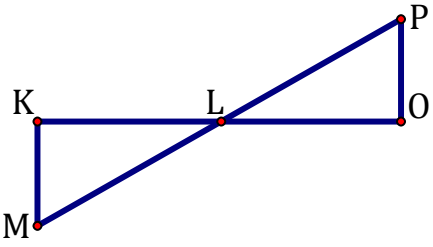


29) Find the values of x and y given $\angle ABD \cong \angle CBD$, B is midpoint of $\overline{AC}$, $m\angle A = x + 5y + 72$, $m\angle DBC = 120 + 8x - 3y$, $m\angle C = 76 - x$, and $m\angle BDC = 11$.



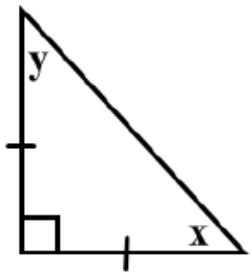
30) Solve given L is the midpoint of $\overline{KO}$ and $\overline{MP}$, ML = 14x + 2y, KL = x – 5y, LP = 10, and LO = 11.



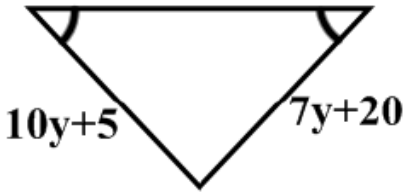
Day 10 & Day 11 Homework Part 1

4. Find the values of the variables in the diagrams below:

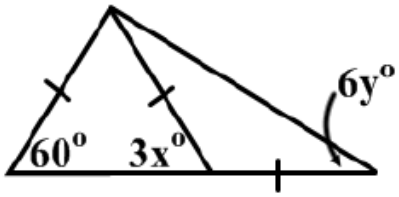
a.



b.



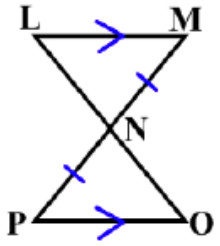
c.



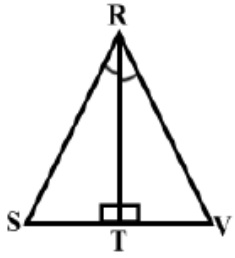
5. In ΔDEF, $m\angle D = (5x + 11)°$, $m\angle E = (9x - 33)°$, and $m\angle F = (4x + 4)°$. What type of triangle is ΔDEF? Explain your reasoning.

6. Write the name of the postulate/theorem used to prove the following triangles congruent:

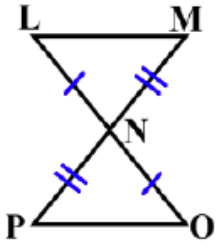
a.



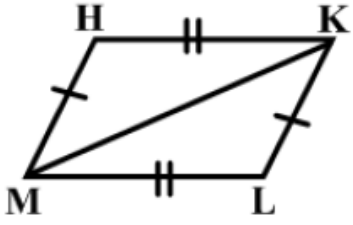
b.



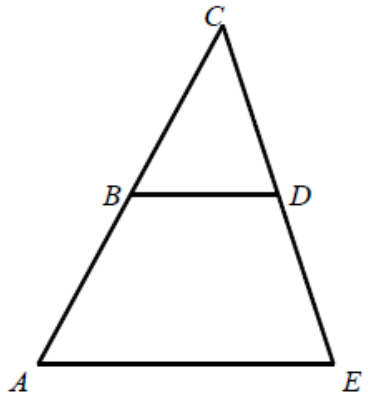
c.



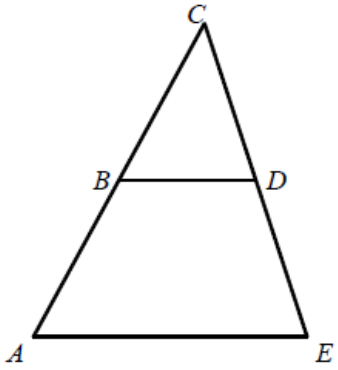
d.



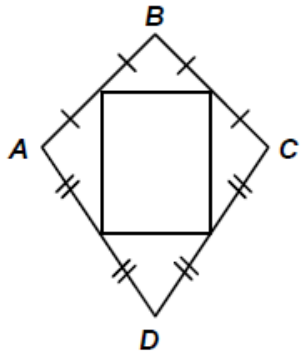
1. Solve for x given $BD = \frac{5}{2}x + 3$ and $AE = 6x + 4$. Assume B is the midpoint of $\overline{AC}$ and D is the midpoint of $\overline{CE}$.



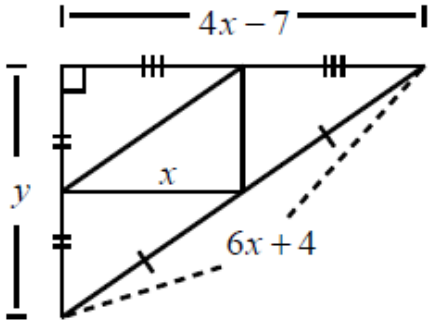
2. Solve for x given $BD = \frac{7}{2}x + 2$ and $AE = 3x + 6$. Assume B is the midpoint of $\overline{AC}$ and D is the midpoint of $\overline{CE}$.



5. Find the area of the rectangle if $\overline{AC} = 11$ and $\overline{BD} = 22$.

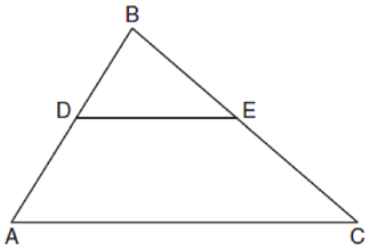


10. Find the values of x and y.



11. If the midpoints of the sides of a triangle are connected, the area of the triangle formed is what part of the area of the original triangle?

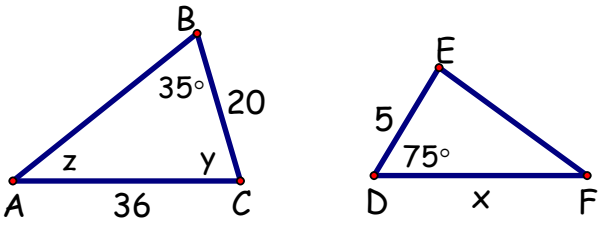
12. In the diagram below of *ABC*, *DE* is a midsegment of triangle *ABC*, *DE* = 7, *AB* = 10, and *BC* = 13. Find the perimeter of *ABC*.



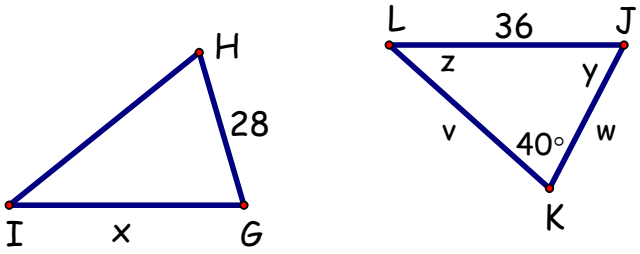
Day 10 & Day 11 Homework Part 2 - Mixed Unit 1 Practice

Find the values of the variables.

1. $\Delta ABC \sim \Delta FED$

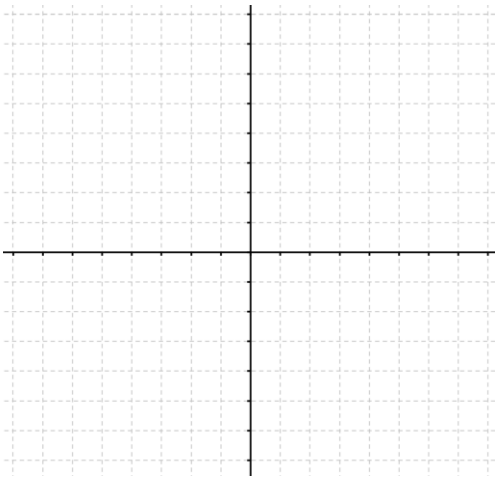


2. $\Delta GHI \cong \Delta JKL, \angle G \cong \angle I$



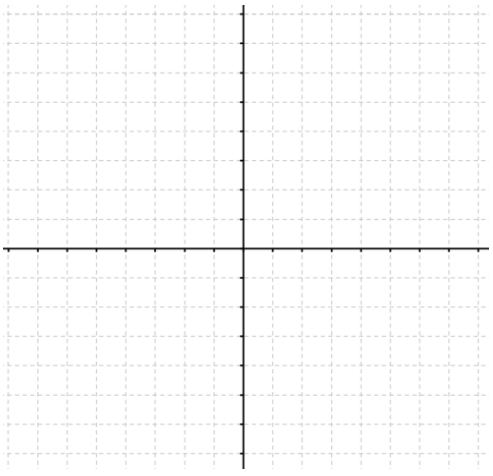
For #3 and 4, use A (1, -1), B (4, -1), and C (2, 2),

3. A composition of a reflection
   over y = 1, then over y = -2
   a) complete the composition
   b) describe specifically how 1 transformation could complete the composition in part a.



   c) give the algebraic rule for the transformation in part b.

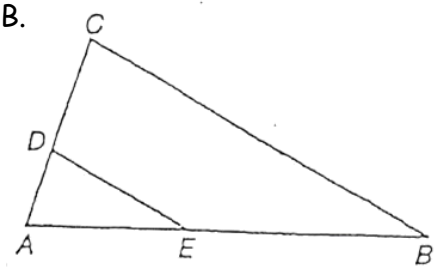
4. A composition of a reflection
   over y = -x, then over y = x
   a) complete the composition
   b) describe specifically how 1 transformation could complete the composition in part a.



   c) give the algebraic rule for the transformation in part b.

Given the triangles shown are similar, $m\angle ADE = m\angle C$, and $m\angle AED = m\angle B$.

5. Write a similarity statement.



6. Find x if DC = 18, AD = 6, AE = 12, EB = x – 3

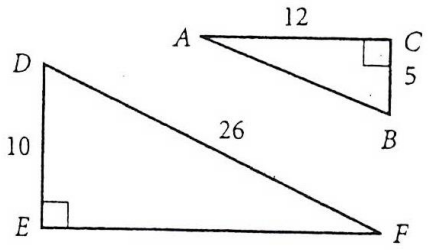
7. Solve if AC = 30, AD = 10, AE = 22, EB = x + 4

8. The lengths of the sides of a triangle are 8, 12, and 16. If the length of the shortest side of a similar triangle is 6, find the length of its longest side.

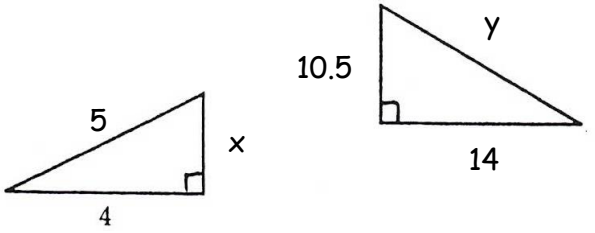
9. The sides of a triangle are 8, 10, and 12. Find the perimeter of a similar triangle in which the side corresponding to the longest side in the first triangle is 30.

Find the missing sides of each pair of similar triangles.

10. $\Delta ACB \sim \Delta FED$

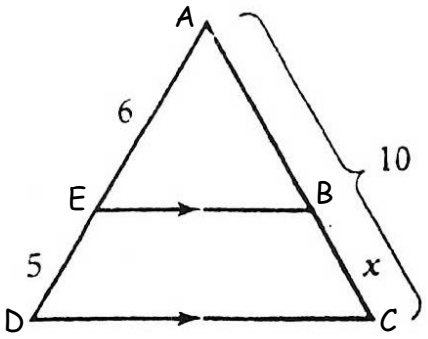


11.

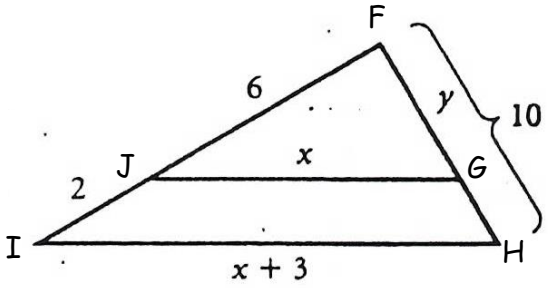


Solve for the values of the variables.

12. $\Delta ACD \sim \Delta ABE$



13. $\Delta FHI \sim \Delta FGJ$



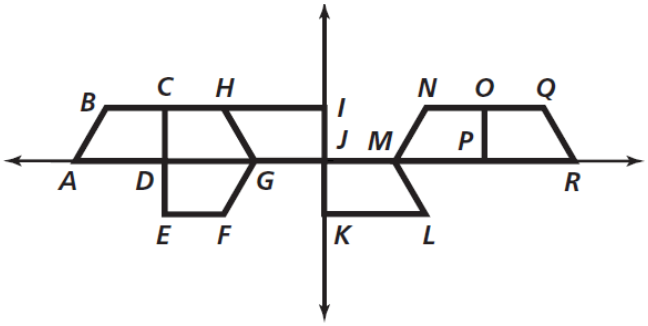
Identify the transformation as a reflection, rotation, translation, or a composition of a translation and a reflection. Be specific in your descriptions.

14. $\square ABCD \rightarrow \square GHCD$

15. $\square HGJI \rightarrow \square LMJK$

16. $\square GFED \rightarrow \square RQOP$

17. $\square MNOP \rightarrow \square ABCD$



18. Find a single transformation that has the same effect as the composition < 7, 4 > followed by < -2, 4 > . Be specific in your description.

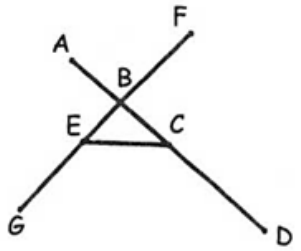
19. In ΔRST, M is the midpoint of $\overline{RS}$, N is the midpoint of $\overline{ST}$, and P is the midpoint of $\overline{RT}$. Find the perimeter of ΔMNP if RS = 28, ST= 34, and RT = 30. (Hint: Draw a picture! ☺)

Day 12 Homework

1. Point C lies on $\overline{AB}$ such that $AC = \frac{1}{4}AB$. If the endpoints of $\overline{AB}$ are A(8, 12) and B(-4, 0), find the coordinates of C. (Hint: use graph paper!)

2. Suppose $\overline{PQ}$ has endpoints P(2, 3) and Q(8, -9). Find the coordinates of R and S so that R lies between P and S and $\overline{PR} \cong \overline{RS} \cong \overline{SQ}$. (Hint: use graph paper!)

3. In the figure below, $\overline{EC}$ **bisects** $\overline{AD}$ at C, and $\overline{EF}$ **bisects** $\overline{AC}$ at B. For each of the following, find the value of x and the measure of the indicated segment.



a) $AB = 3x + 6,\ BC = 2x + 14;\ \overline{AC}$

b) $AC = 5x - 8,\ CD = 16 - 3x;\ \overline{AD}$

c) $AD = 6x - 4, AC = 4x - 3;\ \overline{CD}$

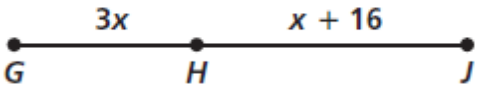
d) $AC = 3x - 1,\ BC = 12 - x;\ \overline{AB}$

e) $AD = 5x + 2,\ BC = 7 - 2x;\ \overline{CD}$

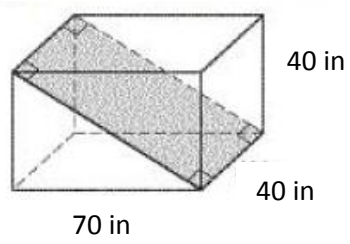
f) $AB = 4x + 17,\ CD = 25 + 5x;\ \overline{BC}$

4. A rectangle has vertices A(-1,1), B(3,4), C(6,0), and D(2,-3).
   a. Graph the rectangle on separate sheet of graph paper.
   b. Find the area and perimeter of the rectangle (be specific – you may need the distance formula!!)

5. IF GJ = 32, find:
   a. X
   b. GH
   c. HJ

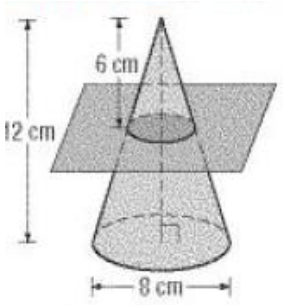


6. In the figure, the shaded region is a planar cross-section of the rectangular solid. What is the area of the cross-section to the nearest square inch?



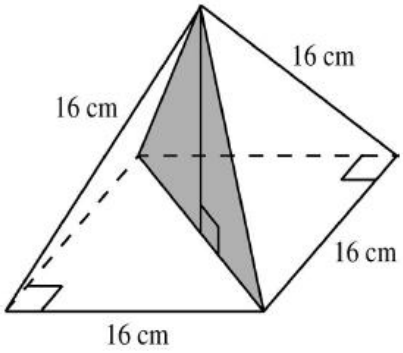
a. 220 square inches
b. 3,225 square inches
c. 57,612 square inches
d. 112,000 square inches

7. A right circular cone with diameter of base 8 centimeters and height 12 centimeters is shown. What is the radius of the cross-section that occurs 6 centimeters from the vertex, parallel to the base?



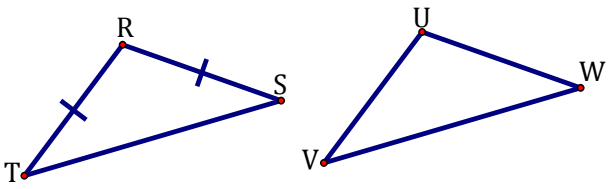
a. 2 centimeters
b. 4 centimeters
c. 6 centimeters
d. 8 centimeters

8. Challenge: The shaded area in the figure below is a planar cross section of the pyramid. The pyramid's edges are all 16 centimeters long and the base of the pyramid is a square. (The figure may not be drawn to scale.) What is the perimeter of the cross section?



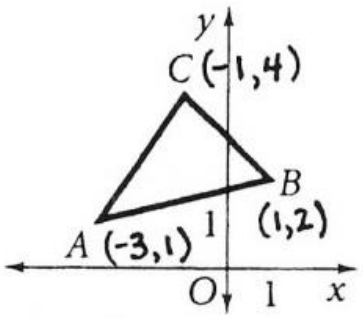
9. Find the values of x and y given

$\Delta RST \cong \Delta UVW$, $m\angle T = 3x + 2y$, $m\angle S = 9$, and $m\angle W = x + y + 6$.



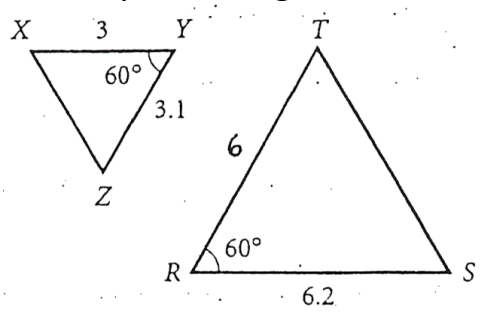
Day 13 Homework Unit 1 Test Review

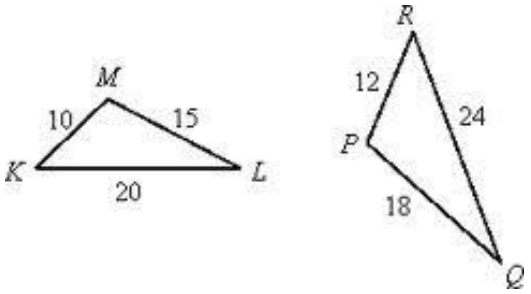
For exercises 1-6, use ΔABC. Write the coordinates of each image, then write its algebraic rule. Show work on separate graph paper, as needed.



1. a dilation four times the original size
2. a rotation of 90˚
3. a rotation of 180˚
4. a translation 2 units left and 3 units down
5. a reflection in the x-axis
6. a reflection over y = -x

Given the similar triangles shown, determine the scale factor, write a similarity statement, and explain why the triangles are similar.

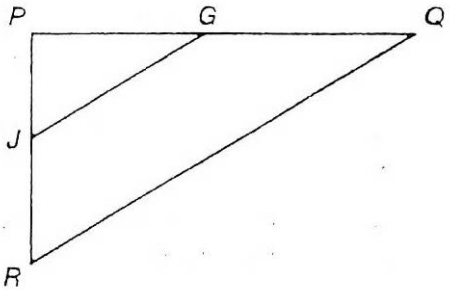
7. 

8. 

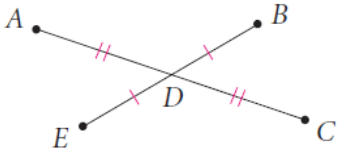
If ΔPGJ ~ ΔPQR, determine the values of x and y.

9. $PJ = 6$, $JG = 5$, $PG = 4$, $GQ = x$, $RQ = x + 6$, $JR = y$

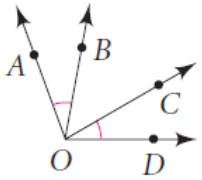
10. $RQ = 10$, $JG = 8$, $JR = x$, $PJ = 2x + 1$, $PG = 2y$, $PQ = 5y - 2$



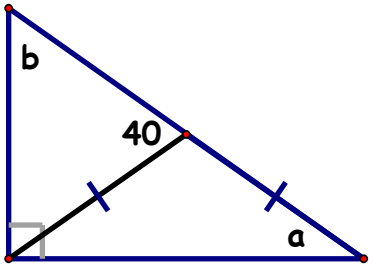
11. If AD = 12 and AC = 4y – 36, find y, AC and DC.



12. Given m∠AOC = 7x – 2, m∠AOB=2x + 8, and m∠BOC = 3x + 14, find m∠AOC.

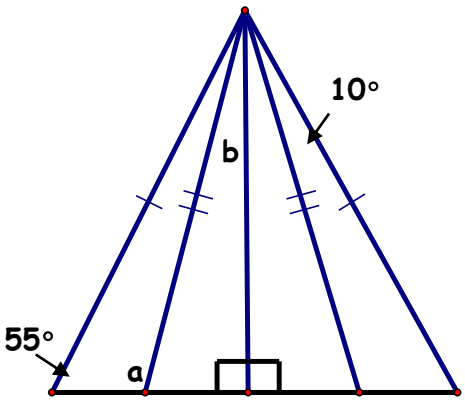


13. Solve for a and b.



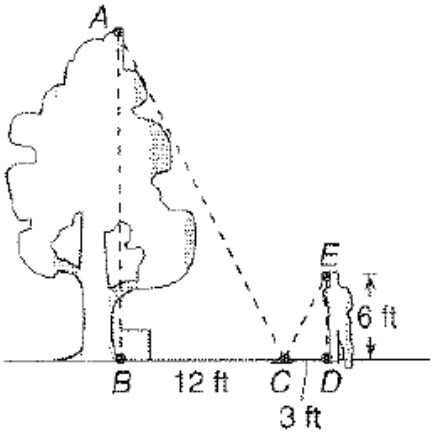
a = _____, b = _____

14. Solve for *a* and *b*.



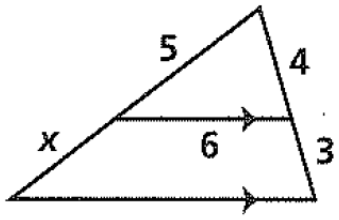
a = _____, b = _____

15. Find the height of the tree using a proportion.

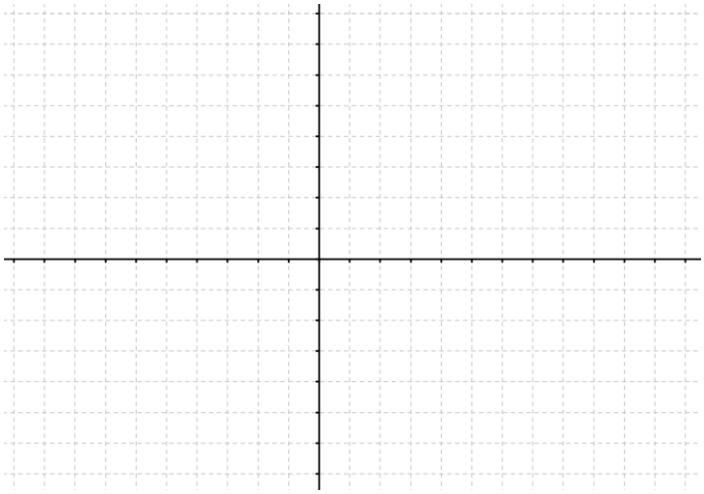


16. Specifically describe a single translation that has the same effect as the composition: <6, 5> followed by <-4, 5>.

17. ΔTNQ ~ ΔLNP. Find x and y.



18. Given points M(1, 2), A(1, -1), and T(3, 2),

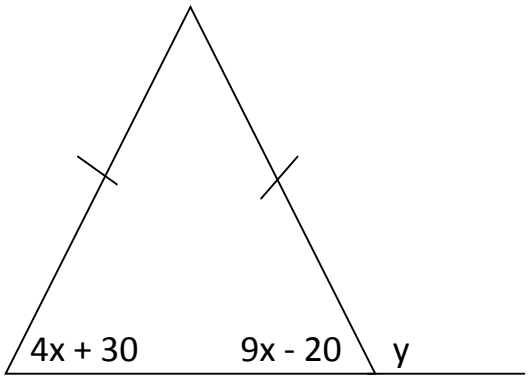


a. Draw and Label ΔMAT.

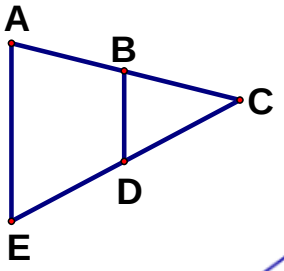
b. Draw the reflection of ΔMAT across the line y = -2. Label this ΔM'A'T'.

c. Draw the reflection of ΔMAT across the line x = 4. Label this ΔM''A''T''.

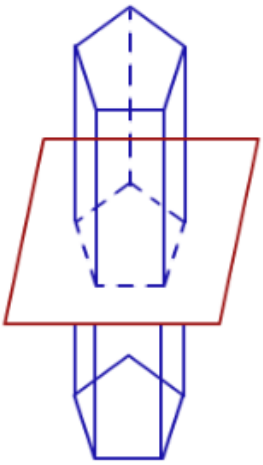
19. Find x and y.



20. Find the length of BD given that AE = 4x + 6 and BD = x + 4. B is the midpoint of $\overline{AC}$ and D is the midpoint of $\overline{CE}$.



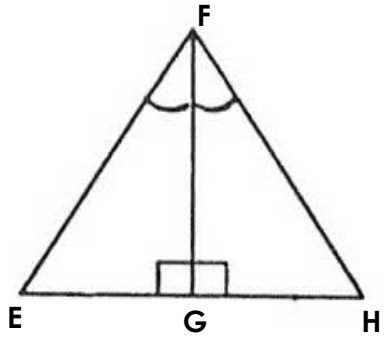
21. Find the type of the cross section when a plane parallel to the base passes through the prism shown.



a. b. c. d.

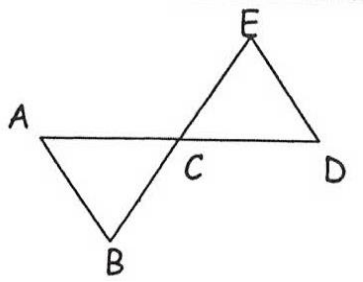
Can the triangles be proven congruent? If so, write the congruence statement and state which postulate can be used to prove them congruent.

22.



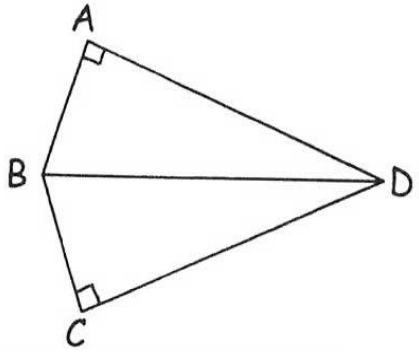
ΔEGF ≅ _____ by _____

23. $\overline{BE}$ bisects $\overline{AD}$, $\overline{BC} \cong \overline{CE}$



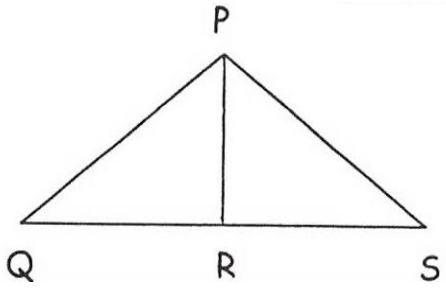
ΔABC ≅ _____ by _____

24. $\overline{AD} \cong \overline{CD}$



ΔABD ≅ _____ by _____

25. R is the midpoint of $\overline{QS}$ and $\overline{PQ} \cong \overline{PS}$



ΔPQR ≅ _____ by _____

Algebra Review: Simplifying Square Roots

Part I: Square Roots of Perfect Squares: Below you will find the most commonly used perfect squares. Complete each statement.

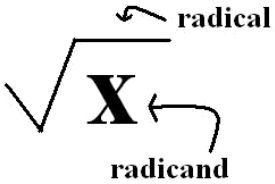
1. $\sqrt{169}$ 2. $\sqrt{324}$ 3. $\sqrt{400}$ 4. $\sqrt{81}$ 5. $\sqrt{36}$ 6. $\sqrt{4}$

7. $\sqrt{144}$ 8. $\sqrt{361}$ 9. $\sqrt{121}$ 10. $\sqrt{256}$ 11. $\sqrt{196}$ 12. $\sqrt{441}$

13. $\sqrt{100}$ 14. $\sqrt{64}$ 15. $\sqrt{25}$ 16. $\sqrt{225}$ 17. $\sqrt{625}$ 18. $\sqrt{289}$

19. $\sqrt{16}$ 20. $\sqrt{9}$ 21. $\sqrt{49}$ 22. $\sqrt{576}$ 23. $\sqrt{1}$

Part II: Read the following example problem about Simplifying Square Roots.



Example Simplify $3\sqrt{50}$

1) 50 is not a perfect square, so our answer we will not be an integer.
2) $3\sqrt{50} = 3\sqrt{25 \bullet 2}$
3) $= 3\sqrt{25} \bullet \sqrt{2}$
4) $= 3 \bullet 5\sqrt{2}$
5) $= 15\sqrt{2}$
6) $\sqrt{2}$ cannot be simplified further, so $15\sqrt{2}$ is our answer

Steps Explained Here:

1) First, check the radicand. If the radicand is a perfect square, then your answer will be an integer.
2) Factor your radicand into a perfect square and the other factor.
3) Your factored radical can be broken up into your perfect square radical times the other radical.
4) Simplify your perfect square.
5) Multiply coefficients (front numbers) together.
6) Before finishing, always check that your radical cannot be simplified any further!!

Part III: Simplify Square roots! Show ALL work! Use separate paper, if needed.

24. $\sqrt{135}$ 25. $\sqrt{32}$ 26. $\sqrt{48}$ 27. $-\sqrt{60}$ 28. $\sqrt{147}$

29. $6\sqrt{128}$ 30. $9\sqrt{112}$ 31. $3\sqrt{162}$