Transformations Stretch

21. _____ units A point P(−3, 2) is translated right 4 units to its image P′. The point P′ is then translated up 3 units to its image P″. What is the distance from P to P″?

22. _____ units A segment has endpoints A(0, 0) and B(−3, 4). Point C is the image of point B translated down 4 units and left 3 units. What is the perimeter of $\triangle ABC$?

23. (,) A point Q(−3, 4) is reflected across the x-axis, and then the image Q′ is reflected across the line $x = 2$. What are the coordinates of the image Q″? Express your answer as an ordered pair.

24. _____ A point S(1, 6) is reflected across the line $x - 2y = -6$. What is the sum of the coordinates of the image S′?

25. (,) What are the coordinates of the image of point D(−5, −3) when it is rotated 90 degrees clockwise about the origin? Express your answer as an ordered pair.

26. (,) What are the coordinates of the image of the point E(3, −1) when it is rotated 90 degrees counterclockwise about the point F(5, 4)? Express your answer as an ordered pair.

27. _____ A segment with endpoints G(−2, 3) and H(4, 7) is dilated by a scale factor of $\frac{2}{3}$ with center of dilation (0, 0). What is the sum of all the coordinates of G′ and H′?

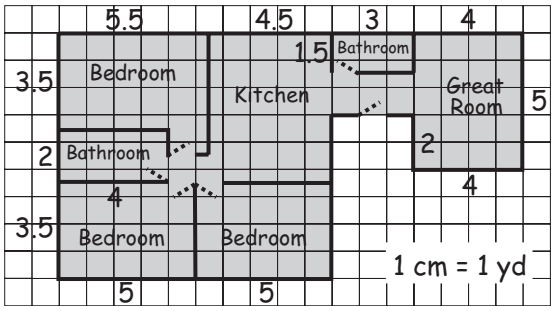
28. _____ Point J(4, 8) is dilated by a scale factor of $\frac{3}{2}$ with center of dilation K(2, 2). What is the product of the coordinates of J′?

29. _____ units^2 A point L(−2, 4) is rotated 90 degrees clockwise about the point M(3, 2). Point N is the image of L′ dilated by a scale factor of $\frac{3}{2}$ with center of dilation M. What is the area of $\triangle LMN$? Express your answer as a common fraction.

30. _____ units A point R(−5, 3) is reflected across the line $y = x - 2$, and then the image R′ is rotated 90 degrees clockwise about the origin. What is the distance from R to R″? Express your answer in simplest radical form.

Proportional Reasoning Stretch

Questions #1-5 refer to the house floor plan shown below. In the figure, each pair of consecutive sides forms a right angle. The plan is drawn on graph paper with all dimensions given in centimeters.



Front

1. _____ feet What is the length, in feet, of the house (across the back)?

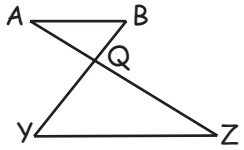
2. _____ feet What is the greatest width, in feet, of the house (front to back)?

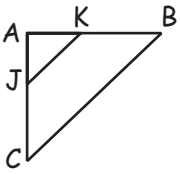
3. _____ sq feet How many square feet of floor space are represented in the floor plan of the house?

4. _____ sq feet How many square feet of carpet will be needed to carpet the Great Room?

5. _____ tiles The two bathroom floors are to be tiled using 6-inch by 6-inch square tiles. How many tiles will be needed if allowance is not made for bathroom fixtures?

6. _____ units In the figure to the right, segment AB is parallel to segment YZ. If AZ = 42 units, BQ = 12 units and QY = 24 units, what is the length of segment QZ?



7. _____ units 

In the figure, triangle AJK is a right triangle with angle A a right angle and segment JK parallel to segment CB. If AK = 21 units, JK = 29 units and AC = 50 units, what is the length of segment CB? Express your answer as a decimal to the nearest tenth.

8. _____ If $3x = 8y$ when $5y = 15z$, what is the simplified value of $\frac{x}{z}$?

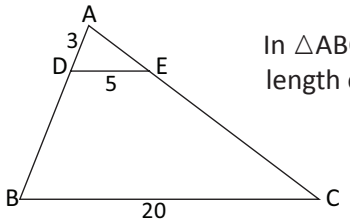
9. _____ When a square is enlarged such that its new perimeter is three times its original perimeter, what is the ratio of the square's original area to its new area? Express your answer as a common fraction.

10. _____ free throws Owen made exactly 72% of his free throws during the first half of the basketball season, and he made six free throws during the second half of the season. For the entire season he made exactly 60% of his free throws. What is the fewest possible number of free throws Owen could have attempted during the second half of the season?

Similarity Stretch

Two geometric figures are similar if all of their corresponding angles are congruent and all of their corresponding sides are proportional. This means that the figures have the exact same shape but not necessarily the same size. For two triangles to be similar, it is sufficient to know that two pairs of corresponding angles are congruent.

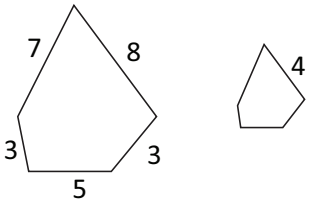
293. _____ units



In △ABC, $\overline{DE}$ is parallel to $\overline{BC}$, AD = 3, DE = 5 and BC = 20. What is the length of $\overline{BD}$?

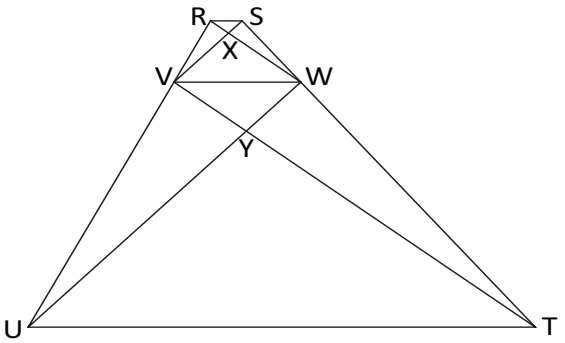
294. _____ units

The two pentagons shown here are similar, with the side of length 4 in the smaller pentagon corresponding to the side of length 8 in the larger pentagon, and with the indicated lengths given. What is the perimeter of the smaller pentagon?

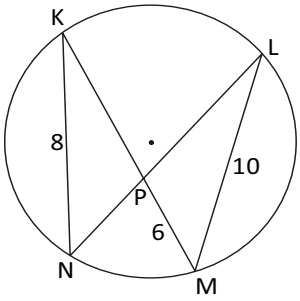


295. _____ units

In the figure below, $\overline{RS}$, $\overline{VW}$ and $\overline{UT}$ are parallel. If RS = 3, VW = 12, UT = 48 and XW = 10, what is the length of $\overline{YT}$?



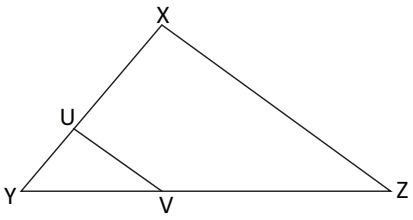
296. _____ units



Chords KM and NL of the circle shown intersect at point P. If KN = 8, PM = 6 and LM = 10, what is the length of $\overline{PN}$? Express your answer as a decimal to the nearest tenth.

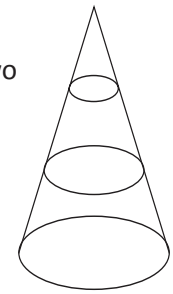
297. _____

Given that $\overline{UV}$ and $\overline{XZ}$ are parallel and that YV = 3 and YZ = 5, what is the ratio of the area of ΔUYV to the area of trapezoid UVZX? Express your answer as a common fraction.

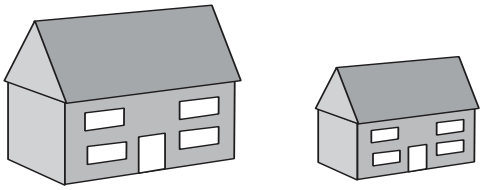


298. _____ units^2 Trapezoid ABCD has right angles at A and D, and diagonals AC and BD intersect at point E. The area of ΔABE is 25 units^2, and the area of ΔDEC is 49 units^2. If AD = 6, what is the area of trapezoid ABCD?

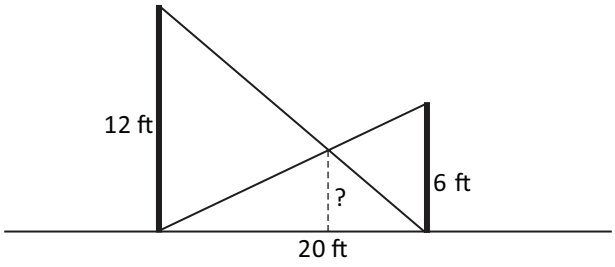
299. _____ In the figure shown, the largest cone has been divided into a smaller cone and two frustums by two planes that trisect the altitude of the original cone. What is the ratio of the volume of the smaller frustum to the volume of the larger frustum? Express your answer as a common fraction.



300. _____ cm^2 The two toy houses shown here are similar. If the volume of the larger one is 1000 cm^3 and the volume of the smaller one is 216 cm^3, what is the surface area of the smaller house if the larger one has a surface area of 400 cm^2?



301. _____ ft Two vertical poles with heights 6 ft and 12 ft, respectively, are placed 20 ft apart. A wire is strung from the top of each pole to the base of the other pole. How high above the ground do the two wires cross?



302. _____ ft Two vertical poles are *a* ft and *b* ft tall, respectively. A wire is strung from the top of each pole to the base of the other pole. How high above the ground do the two wires cross? Express your answer as a common fraction in terms of *a* and *b*.