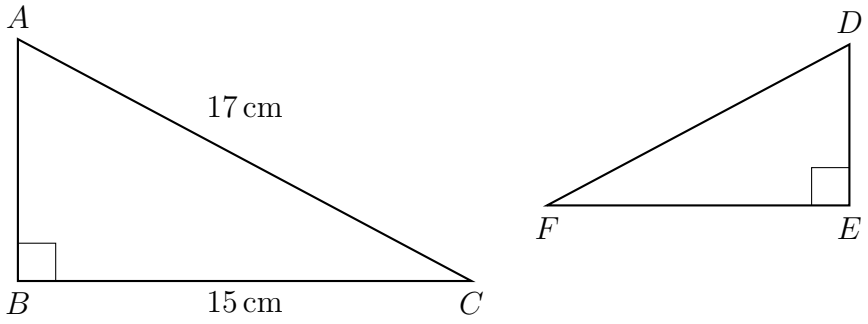
Mixed Review Name:
2 May 2022

Regents review and practice **January 2020**

1. A cone has a volume of 108π and a base diameter of 12. What is the height of the cone?

2. The endpoints of directed line segment PQ have coordinates of $P(-7, -5)$ and $Q(5, 3)$. What are the coordinates of point A, on $\overline{PQ}$, that divide $\overline{PQ}$ into a ratio of 1:3?

3. Kayla was cutting right triangles from wood to use for an art project. Two of the right triangles she cut are shown below.



   If $\triangle ABC \sim \triangle DEF$, with right angles B and E, $BC = 15$ cm, and $AC = 17$ cm, what is the measure of $\angle F$, to the *nearest degree*?

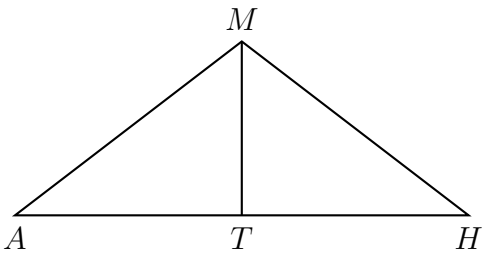
4. Jaden is comparing two cones. The radius of the base of cone A is twice as large as the radius of the base of cone B. The height of cone B is twice the height of cone A. The volume of cone A is

   (a) twice the volume of cone B
   (b) four times the volume of cone B
   (c) equal to the volume of cone B
   (d) equal to half the volume of cone B

5. A regular hexagon is rotated about its center. Which degree measure will carry the regular hexagon onto itself?

   (a) 45° (c) 120°
   (b) 90° (d) 135°

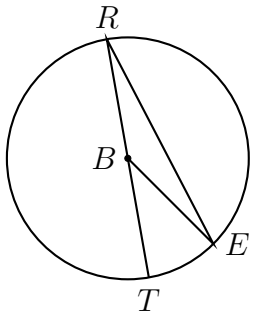
6. In triangle MAH below, $\overline{MT}$ is the perpendicular bisector of $\overline{AH}$.



Which statement is *not* always true?

(a) $\triangle MAH$ is isosceles.
(b) $\triangle MAT$ is isosceles.
(c) $\overline{MT}$ bisects $\angle AMH$.
(d) $\angle A$ and $\angle TMH$ are complementary.

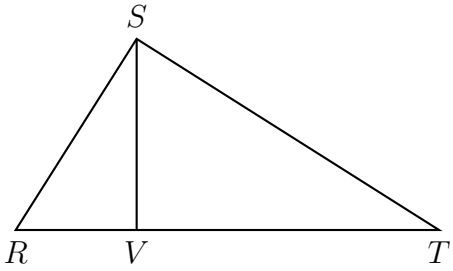
7. In circle B below, diameter $\overline{RT}$, radius $\overline{BE}$, and chord $\overline{RE}$ are drawn.



It $m\angle TRE = 15°$ and $BE = 9$, then the area of sector EBR is what in terms of π?

8. Lou has a solid clay brick in the shape of a rectangular prism with a length of 8 inches, a width of 3.5 inches, and a height of 2.25 inches. If the clay weighs 1.055 oz/in^3, how much does Lou's brick weigh, to the nearest ounce?

9. In right triangle RST below, altitude $\overline{SV}$ is drawn to hypotenuse $\overline{RT}$.



If $RV = 4.1$ and $TV = 10.2$, what is the length of $\overline{ST}$, to the *nearest tenth*?

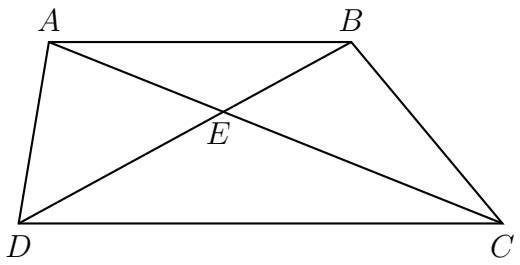
10. For the acute angles in a right triangle, $\sin(4x)^\circ = \cos(3x + 13)^\circ$.
What is the number of degrees in the measure of the smaller angle?

Similarity **January 2020**

11. Triangle JGR is similar to triangle MST. Which statement is *not* always true?

    (a) $\angle J \cong \angle M$
    (b) $\angle G \cong \angle T$
    (c) $\angle R \cong \angle T$
    (d) $\angle G \cong \angle S$

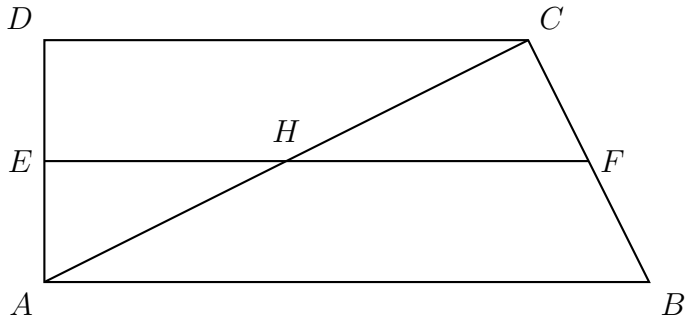
12. In trapezoid $ABCD$ below, $\overline{AB} \parallel \overline{CD}$.



    If $AE = 5.2$, $AC = 11.7$, and $CD = 10.5$, what is the length of $\overline{AB}$, to *the nearest tenth*?

13. The line represented by $2y = x + 8$ is dilated by a scale factor of k centered at the origin, such that the image of the line has an equation of $y - \frac{1}{2}x = 2$. What is the scale factor?

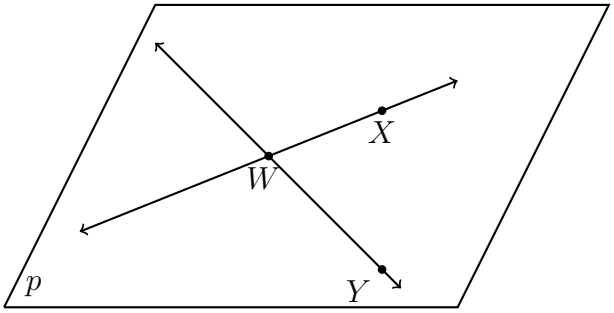
14. In quadrilateral $ABCD$ below, $\overline{AB} \parallel \overline{CD}$, and E, H, and F are the midpoints of $\overline{AD}$, $\overline{AC}$, and $\overline{BC}$, respectively.



    If $AB = 24$, $CD = 18$, and $AH = 10$, then what is FH?

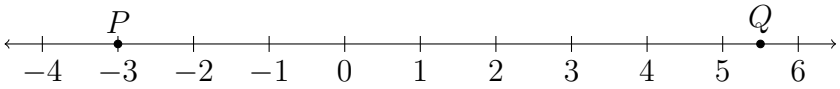
15. Points that are all located on the same plane are _____.

16. Identify three points in the given plane.



17. Given $\overline{ABC}$, $AB = 3x - 4$, $BC = x + 5$, $AC = 13$. Find BC.
Check your answer for full credit.

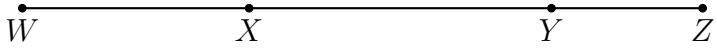
18. Given $\overleftrightarrow{PQ}$ as shown on the number line, with $P = -3$ and $Q = 5.5$.



What is the exact distance on the number line between the points P and Q?

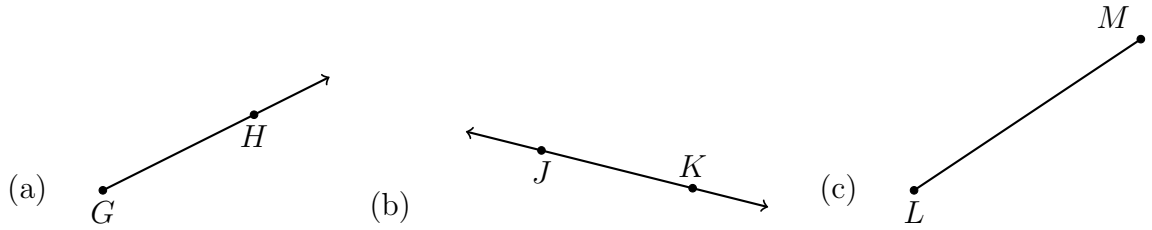
19. Given $\overline{WXYZ}$, $WX = 3\frac{1}{2}$, $XY = 4\frac{3}{4}$, and $YZ = 1\frac{1}{4}$.

Find WZ.

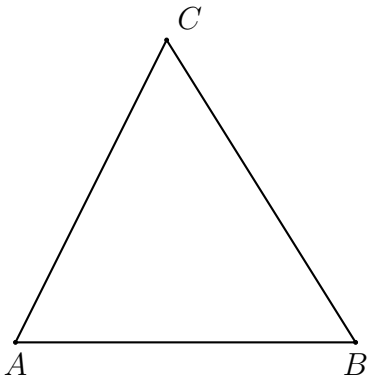


20. Given the points V and W, draw $\overrightarrow{WV}$.

21. Use symbols to write the name of each geometric figure.
.



22. Given $\triangle ABC$ with $\overline{AB} \cong \overline{AC}$. On the diagram mark the congruent line segments with tick marks.

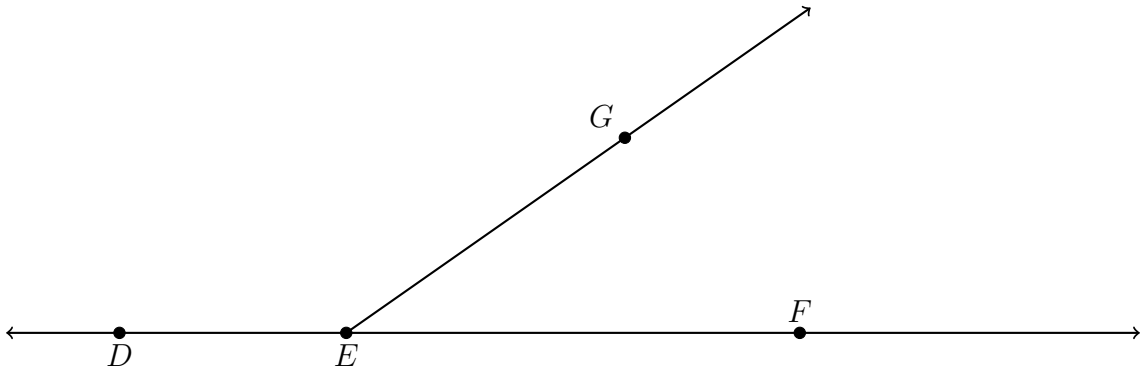


23. Find the measure of the angle in degrees and the given segment's length in centimeters.

(a) $m\angle GEF =$ _____

(b) $EG =$ _____

(c) Name a pair of opposite rays: _____



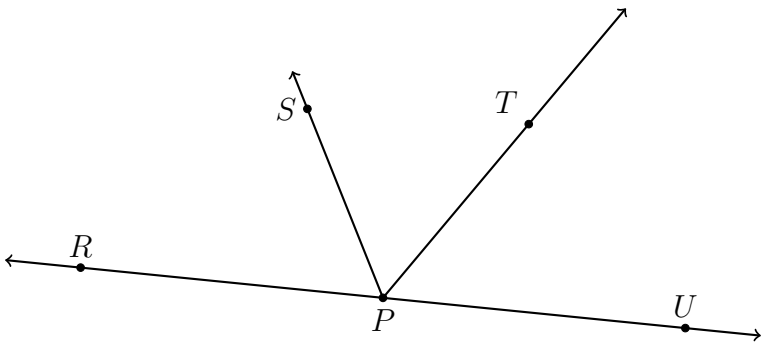
24. Use each term according to its geometric meaning: "sketch", "draw", "construct".

    (a) _____ is to make a freehand diagram showing important features.

    (b) _____ is to depict with accurate measures using ruler, protractor, and compass.

    (c) _____ is a formal, logical process to create geometric figures using only a straightedge and compass.

25. Given the situation in the diagram, answer each question. Circle True or False.

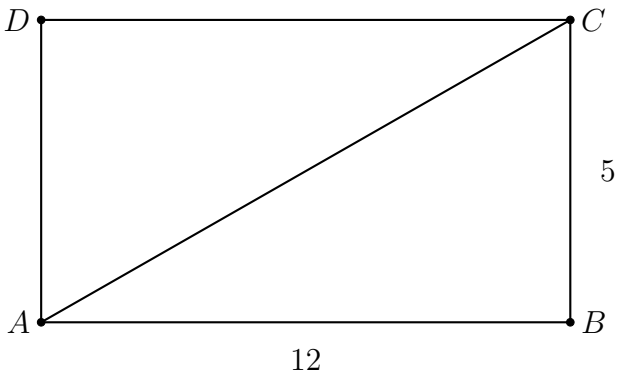


    (a) True or False: $\overrightarrow{PR}$ and $\overrightarrow{PU}$ are opposite rays.

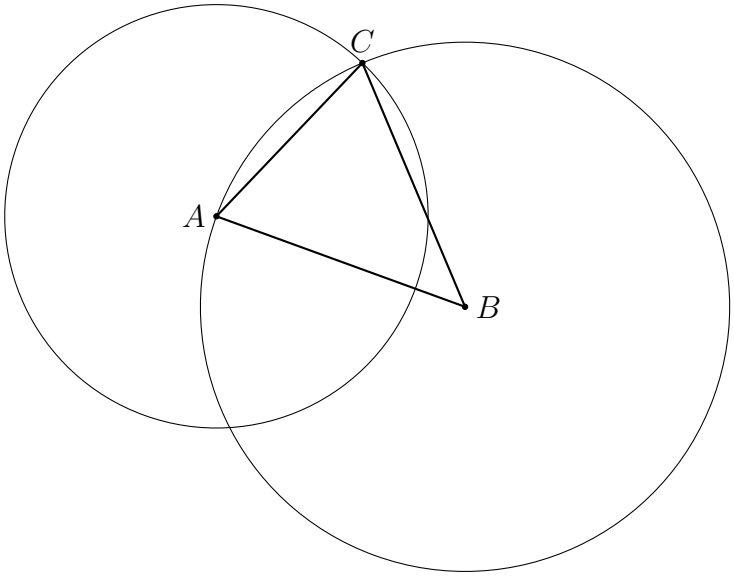
    (b) True or False: $\angle TPR$ is an obtuse angle.

    (c) True or False: $\angle RPS$ and $\angle TPU$ are adjacent angles.

26. Given the rectangle $ABCD$ shown below, with $AB = 12$ and $BC = 5$. The diagonal $\overline{AC}$ is drawn to create two triangles. Find the area of the lower triangle, $\triangle ABC$.



27. A student constructs a triangle with a given side, $\overline{AB}$ as shown below. Is $\triangle ABC$ equilateral? Justify your answer by explaining what was done incorrectly and how it should have been done.



28. In the following two problems, solve for the value of x.

    (a) $3(x-5) = -33$ (b) $3 - \frac{1}{2}x = 2$

29. In the following two problems, solve for the value of x by factoring.

    (a) $x^2 + 6x = -5$ (b) $x^2 = x + 12$