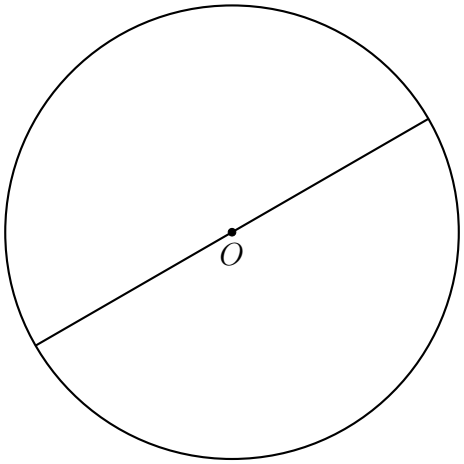
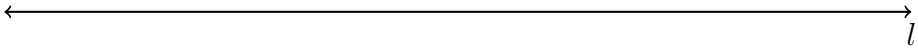
**13.8 Do Now: Cross sections, distance applications**

Use only a compass and straightedge for these constructions. [show the compass marks]

1. Construct a square, inscribed in circle $O$.



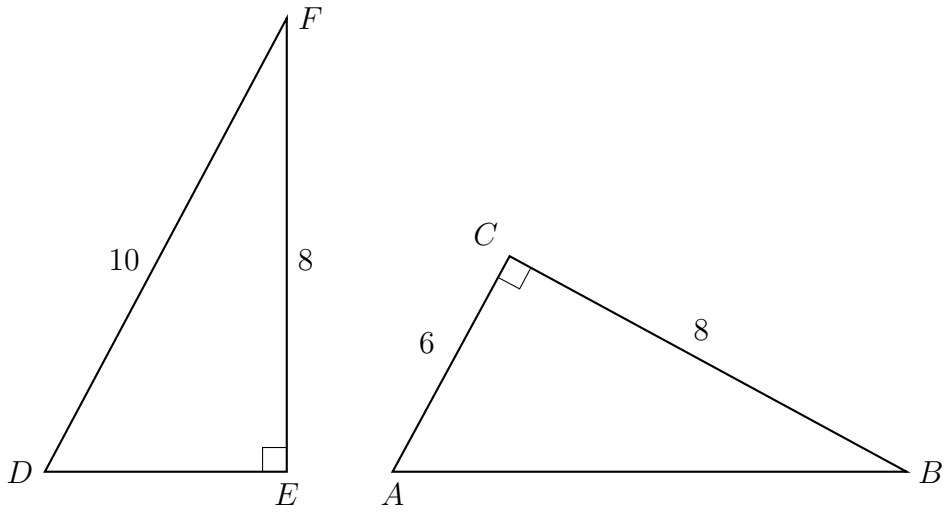

2. Construct a line through the point $P$ that is parallel to the given line $l$.



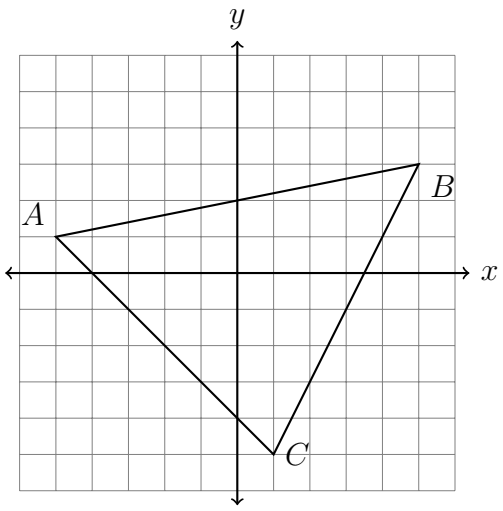

3. Find the length of the line segment $\overline{AB}$, with $A(2, 3)$ and $B(6, -1)$. Simplify the radical.

4. Are the given right triangles congruent? $\triangle ABC$ with $m\angle C = 90°$, $AC = 6$, and $BC = 8$. And $\triangle DEF$ with $m\angle E = 90°$, $DF = 10$, and $EF = 8$.

   Justify your answer.



5. Prove that $\triangle ABC$ is an isosceles triangle but not equilateral, given $A(-5, 1)$, $B(5, 3)$, and $C(1, -5)$, as shown below.




Checklist. Confirm that you...

- Calculate lengths $AB$, $AC$ and $BC$ (you do not have to simplify the radical)
- State which sides are congruent and which are not
- Write a concluding statement, that therefore $\triangle ABC$ is an isosceles triangle but not equilateral.

6. Which three-dimensional figure will result when a rectangle 6 inches long and 5 inches wide is continuously rotated about the shorter side?

   (a) a rectangular prism with a length of 6 inches, width of 6 inches, and height of 5 inches

   (b) a rectangular prism with a length of 6 inches, width of 5 inches, and height of 5 inches

   (c) a cylinder with a radius of 5 inches and a height of 6 inches

   (d) a cylinder with a radius of 6 inches and a height of 5 inches

7. An isosceles right triangle whose legs measure 6 is continuously rotated about one of its legs to form a three-dimensional object. The three-dimensional object is a

   (a) cylinder with a radius of 6

   (b) cylinder with a radius of 12

   (c) cone with a radius of 6

   (d) cone with a radius of 12

8. A pyramid is cut perpendicular to its rectancular base. The shape of the cross section is a

   (a) circle

   (b) cylinder

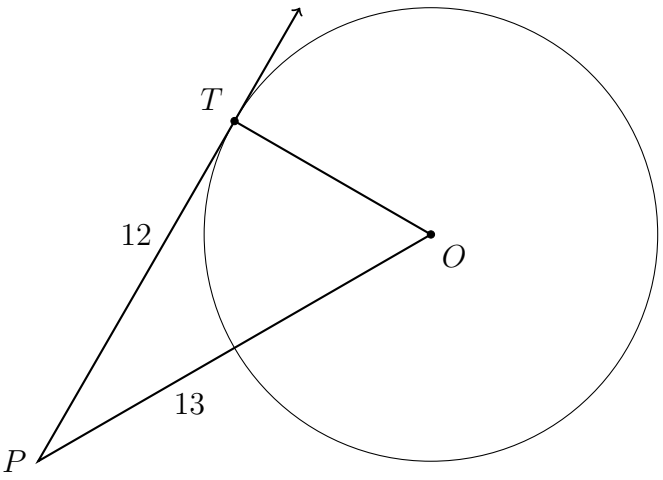
   (c) rectangle

   (d) triangular prism

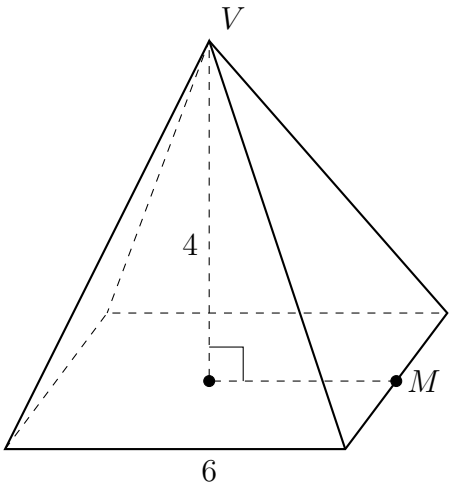
9. Simplify each expression. (Leave it in radical form if necessary, not a decimal.)

   (a) $\sqrt{27}$ (b) $\sqrt{200}$

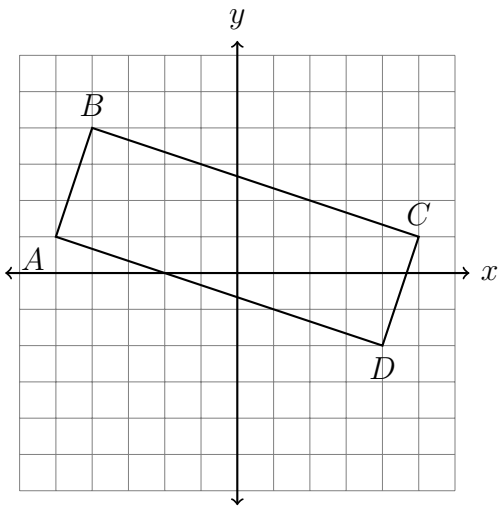
10. Circle $O$ has a tangent line $\overleftrightarrow{PT}$ with point of tangency $T$, as shown. If $OP = 13$ and $PT = 12$, what is the radius of circle $O$?




11. A pyramid has a 6 foot by 6 foot square base and height 4 feet, as shown. Find the slant length of the pyramid from the center of the side of the base at point $M$ to the vertex $V$.



12. Prove that parallelogram $ABCD$ is a rectangle by showing its diagonals are congruent. Given $A(-5, 1)$, $B(-4, 4)$, $C(5, 1)$, and $D(4, -2)$, as shown below.



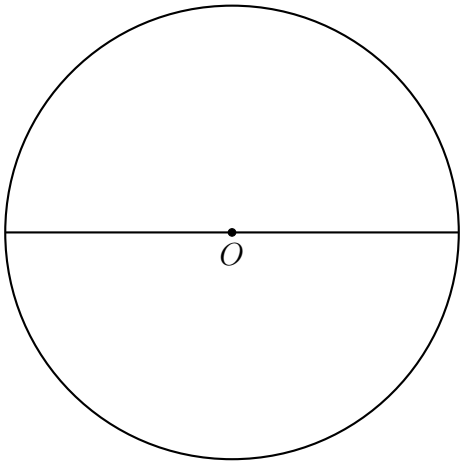

Checklist. Confirm that you...

- Calculate the lengths of the diagonals, $AC$ and $BD$
- State that the diagonals are congruent
- Write a concluding statement, that therefore parallelogram $ABCD$ is a rectangle because it has congruent diagonals.

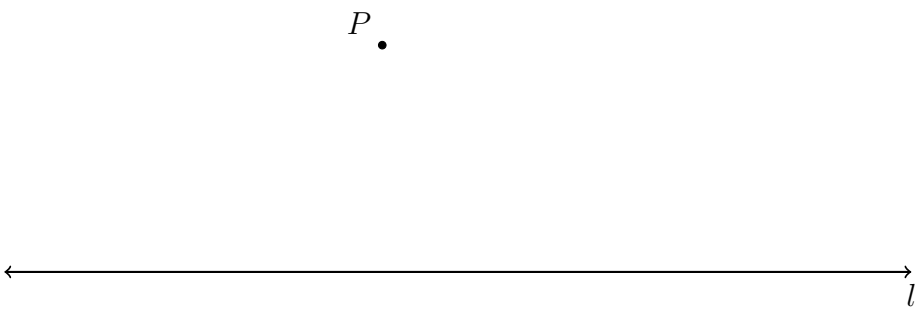
**13.8 Exit Note Quiz: Cross sections, distance applications**

Use only a compass and straightedge for these constructions. [show the compass marks]

1. Construct a square, inscribed in circle $O$.



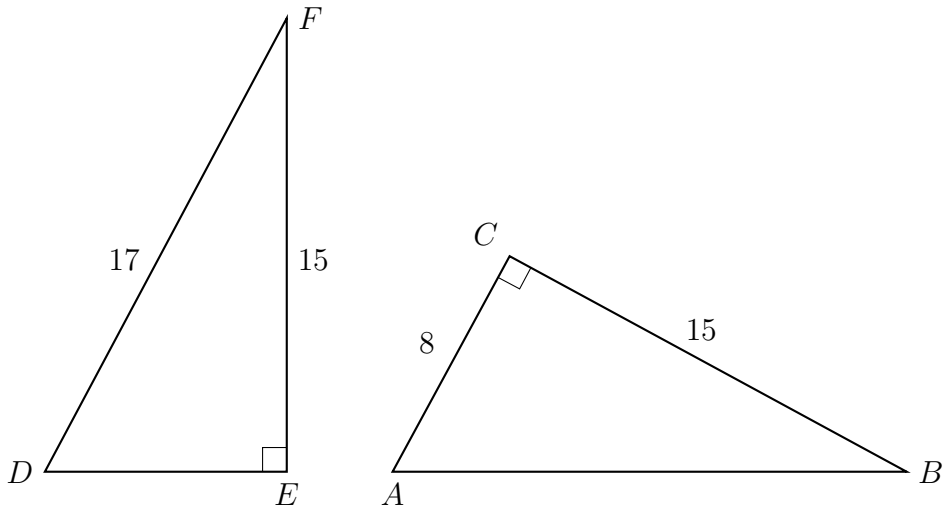

2. Construct a line through the point $P$ that is parallel to the given line $l$.



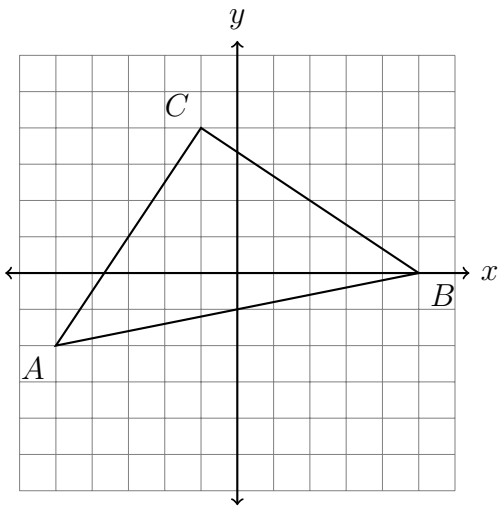
3. Find the length of the line segment $\overline{AB}$, with $A(1, 3)$ and $B(6, -2)$. Simplify the radical.

4. Are the given right triangles congruent? $\triangle ABC$ with $m\angle C = 90°$, $AC = 8$, and $BC = 15$. And $\triangle DEF$ with $m\angle E = 90°$, $DF = 17$, and $EF = 15$.

   Justify your answer.



5. Prove that $\triangle ABC$ is an isosceles triangle but not equilateral, given $A(-5,-2)$, $B(5,0)$, and $C(-1,4)$, as shown below.

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   (b) a rectangular prism with a length of 6 inches, width of 5 inches, and height of 5 inches

   (c) a cylinder with a radius of 5 inches and a height of 6 inches

   (d) a cylinder with a radius of 6 inches and a height of 5 inches

7. An isosceles right triangle whose legs measure 6 is continuously rotated about one of its legs to form a three-dimensional object. The three-dimensional object is a

   (a) cylinder with a diameter of 6

   (b) cylinder with a diameter of 12

   (c) cone with a diameter of 6

   (d) cone with a diameter of 12

8. A right cylinder is cut perpendicular to its base. The shape of the cross section is a

   (a) circle

   (b) cylinder

   (c) rectangle

   (d) triangular prism

9. Simplify each expression. (Leave it in radical form if necessary, not a decimal.)

   (a) $\sqrt{48}$ (b) $\sqrt{32}$