



Creating Perpendicular Bisectors

MATH NSPIRED

Activity Overview:

In this activity, you will construct the perpendicular bisector of a line segment in several different ways.

Materials

- Technology needed (TI-Nspire™ handheld, computer software)



Step 1: Creating the document

- Open a new document by clicking and selecting **New Document**. Choose **Add Notes**.

- Type: Creating Perpendicular Bisectors.

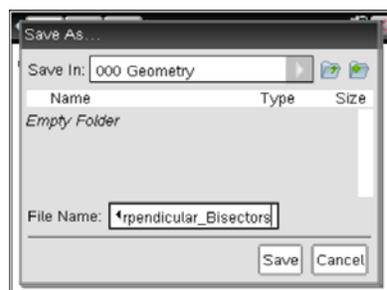
Note: To obtain capital letters, press the key, then the letter.

- Press > **File** > **Save As....**

- Type: Creating_Perpendicular_Bisectors.

- Tab to and press .

Note: To obtain the underscore, press .



Step 2: Method 1: Creating a perpendicular bisector

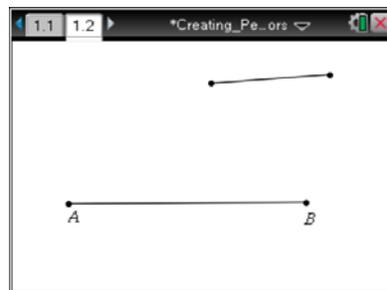
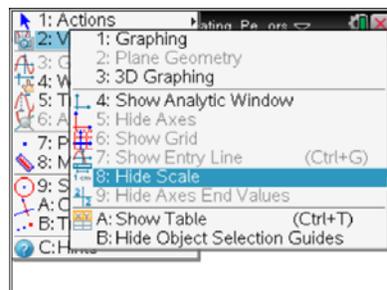
- Add a new page by pressing > **Add Geometry**. (To hide the scale in the right corner of the screen, go to **Menu > View > Hide Scale**.)

- To create a perpendicular bisector of a line segment, begin by creating a line segment. Press **Menu > Points & Lines > Segment**.

- Move the pencil toward the left side of the screen about halfway down. Press to draw a point. Immediately press to label the point.

- Move the pencil to the right side of the screen. A dotted segment will appear. Press to draw another point. Immediately press to label the point.

- At the top of the screen, create a smaller segment that is a little more than half the size of \overline{AB} . This segment does not need to be labeled. Press to exit the **Segment** tool.

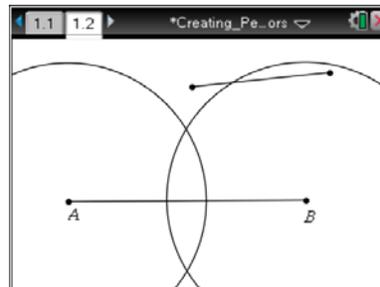




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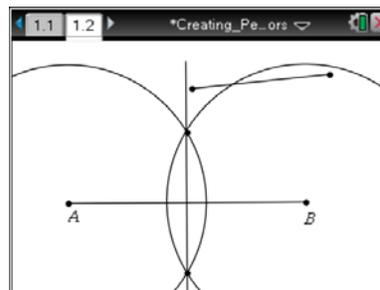
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6. Select the **Compass** tool by pressing **Menu > Construction > Compass**.
7. Move the pencil to the segment at the top of the screen and press  when you see the word *segment*.
8. Move the pencil to point *A* and press . A circle will appear that has a radius equal to the length of the segment at the top of the screen. Move the pencil back to the segment at the top of the screen and press .
9. Move the pencil to point *B* and press . Another circle with the same size radius will be formed. Press **esc**.



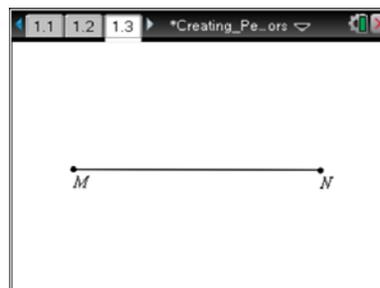
Note: If the two circles do not intersect, grab one of the endpoints of the segment at the top of the screen and pull it to lengthen it (or shorten it) until the two circles intersect.

10. To draw the perpendicular bisector, press **Menu > Points & Lines > Line**.
11. Move the pencil until you get to one of the places where the two circles intersect. It will say *Intersection point*. Press .
12. Move the pencil to the other place where the two circles intersect and press . A line that is perpendicular to \overline{AB} will appear. Press **esc** to exit the **Line** tool.



Step 2: Method 2: Creating a perpendicular bisector

1. Add a new page by pressing **ctrl docv > Add Geometry**. (To hide the scale in the right corner of the screen, go to **Menu > View > Hide Scale**.)
2. To create a perpendicular bisector of a line segment, begin by creating a line segment. Press **Menu > Points & Lines > Segment**.
3. Move the pencil toward the left side of the screen about halfway down. Press  to draw a point. Immediately press **↑shift M** to label the point.
4. Move the pencil to the right side of the screen. A dotted segment will appear. Press  to draw another point. Immediately press **↑shift N** to label the point. Press **esc**.

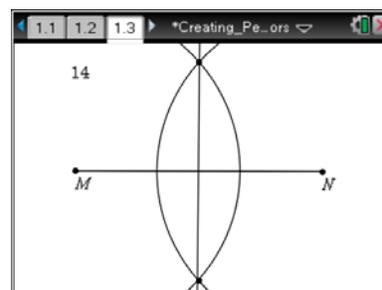
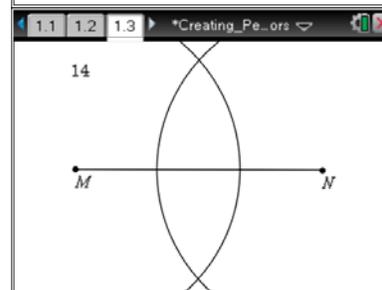
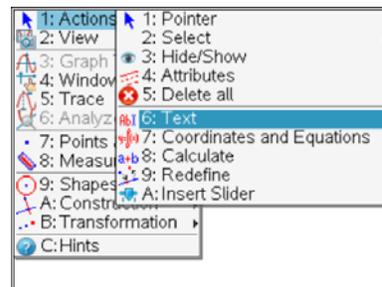




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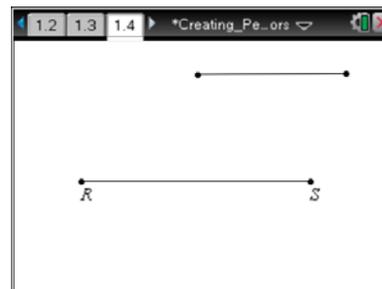
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5. Create a text box by pressing **Menu > Actions > Text**.
 6. Move the cursor to a place to type a number in the upper part of the screen. Press to open the text box. Put a 6 in the box and press **enter**. Press **esc**.
 7. Select the **Compass** tool by pressing **Menu > Construction > Compass**.
 8. Move the pencil and click on the number 6. Then move the pencil to point M and press . A circle with a radius of 6 units will form.
 9. Move the pencil back to the number 6 and press .
 10. Move the pencil to point N and press . Another circle with radius 6 will form. Press **esc**.
- Note:** If the two circles do not intersect, double click on the number 6 and make the number larger until the circles intersect.
11. To draw the perpendicular bisector, press **Menu > Points & Lines > Line**. Move the pencil until you get to the place where the two circles intersect. It will say *Intersection point*. Press .
 12. Move the pencil to the other place where the two circles intersect and press . A line that is perpendicular to \overline{MN} will appear. Press **esc**.



Step 2: Method 3: Creating a perpendicular bisector

1. Add a new page by pressing **ctrl docv > Add Geometry**. (To hide the scale in the right corner of the screen, go to **Menu > View > Hide Scale**.)
2. To create a perpendicular bisector of a line segment, begin by creating a line segment. Press **Menu > Points & Lines > Segment**.
3. Move the pencil toward the left side of the screen about halfway down. Press to draw a point. Immediately press **shift R** to label the point.
4. Move the pencil to the right side of the screen. A dotted segment will appear. Press to draw another point. Immediately press **shift S** to label the point.
5. At the top of the screen, create a smaller segment that is a little more than half the size of \overline{RS} . It does not need to be labeled. Press **esc**.

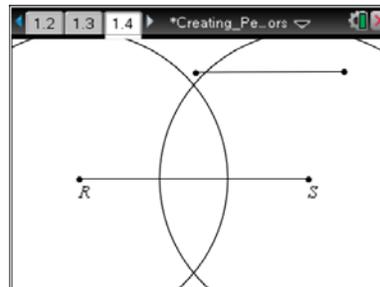




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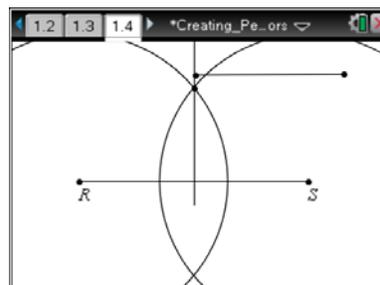
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6. Select the **Compass** tool by pressing **Menu > Construction > Compass**. Move the pencil to the segment at the top of the screen and press . Move the pencil to point R and press . A circle will appear.
7. Move the pencil back to the segment at the top of the screen and press . Move the pencil to point S and press . Another circle will be formed. Press **esc**.



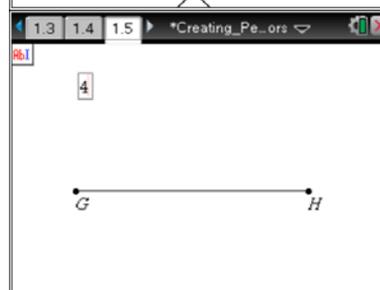
Note: If the two circles do not intersect, grab one of the endpoints of the segment at the top of the screen and lengthen it or shorten it until the two circles intersect.

8. Press **Menu > Construction > Perpendicular**. Move the pencil to the point where the two circles intersect and press . Move the pencil to \overline{RS} and press . The perpendicular bisector will appear. Press **esc**.



Step 2: Method 4: Creating a perpendicular bisector

1. Add a new page by pressing **ctrl doc** > **Add Geometry**. (To hide the scale in the right corner of the screen, go to **Menu > View > Hide Scale**.)
2. To create a perpendicular bisector of a line segment, begin by creating a line segment. Press **Menu > Points & Lines > Segment**.
3. Move the pencil toward the left side of the screen about halfway down. Press to draw a point. Immediately press **shift G** to label the point.
4. Move the pencil to the right side of the screen. A dotted segment will appear. Press to draw another point. Immediately press **shift H** to label the point. Press **esc**.
5. Create a text box by pressing **Menu > Actions > Text**. Move the cursor to a place to type a number in the upper part of the screen. Press to open the text box. Put a 4 in the box and press **enter**. Press **esc**.

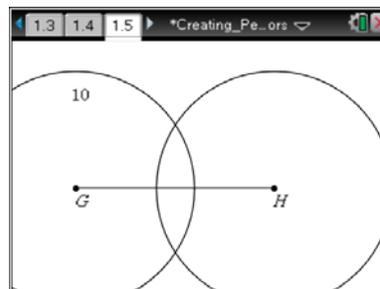




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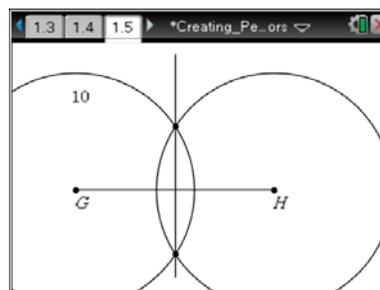
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- Draw two circles that intersect by pressing **Menu > Shapes > Circle**. Move the pencil to the number 4 and press
- Move to point G and press . A circle will form that has a radius of 4 units.
- Move the pencil back to the number 4 and press .
- Move the pencil to point H and press . Another circle with a radius of 4 units will form. Press **esc**.



Note: If the two circles do not intersect, double click on the number 4 and make the number larger until the circles do intersect.

- To draw the perpendicular bisector, press **Menu > Points & Lines > Line**. Move the pencil until you get to the place where the two circles intersect. It will say *Intersection point*. Press .
- Move the pencil to the other place where the two circles intersect and press . A line that is perpendicular to \overline{GH} will appear. Press **esc**.



Step 2: Method 5: Creating a perpendicular bisector

- Add a new page by pressing **ctrl doc > Add Geometry**. (To hide the scale in the right corner of the screen, go to **Menu > View > Hide Scale**.)
- To create a perpendicular bisector of a line segment, begin by creating a line segment. Press **Menu > Points & Lines > Segment**.
- Move the pencil toward the left side of the screen about halfway down. Press to draw a point. Immediately press **shift V** to label the point.
- Move the pencil to the right side of the screen. A dotted segment will appear. Press to draw another point. Immediately press **shift W** to label the point. Press **esc**.
- Press **Menu > Construction > Perpendicular Bisector**. Move the pencil to the line segment. When it turns bold, press . The perpendicular bisector will appear. Press **esc**.
- If desired, right-click (**ctrl menu**) on any geometric object, choose **Color > Line Color** to add color to the object.

