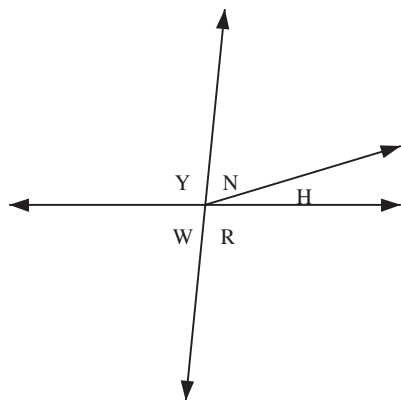


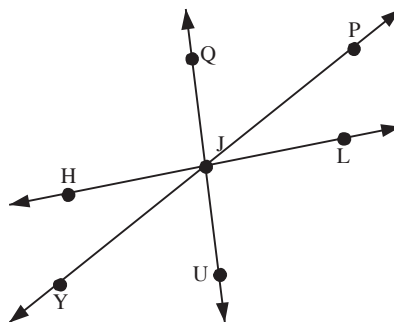
Practice 10-5

Vertical Angles

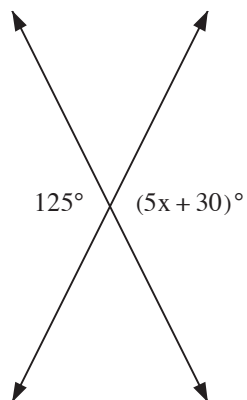
1. Find the pair of vertical angles in the figure.



2. Find the angle that is vertical to $\angle HJY$.

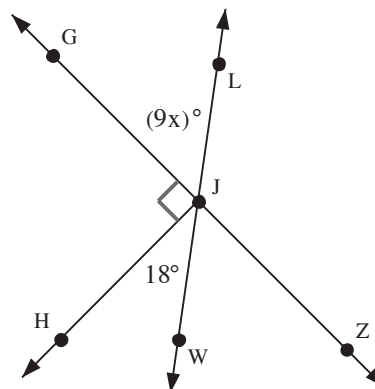


3. Find the value of x .



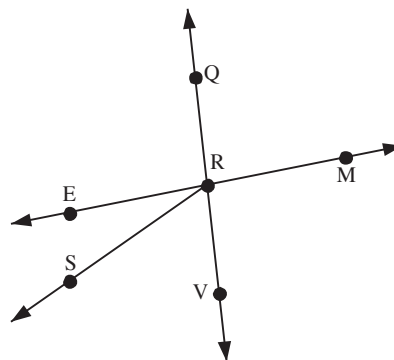
(The figure is not shown to scale.)

4. Find the value of x .

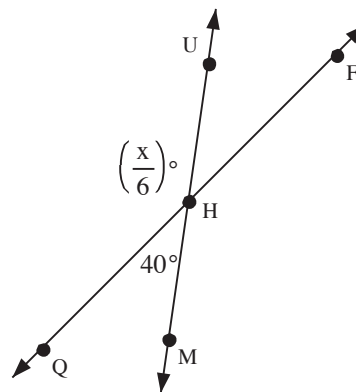


(The figure is not shown to scale.)

5. a) **Writing** Find the angle that is vertical to $\angle QRM$.
b) Explain why $\angle SRE$ is not vertical to $\angle QRM$.



6. a) **Reasoning** Use vertical angles to find the value of x .
- b) Is it possible to find the value of x without using vertical angles? Explain your reasoning.

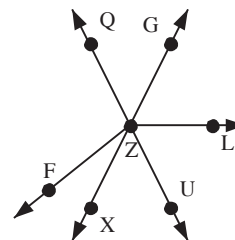


(The figure is not shown to scale.)

7. **Error Analysis** A student needed to find the angle that is vertical to $\angle QZG$. He incorrectly claimed that $\angle FZU$ is vertical to $\angle QZG$.

- a) Which angle is vertical to $\angle QZG$?

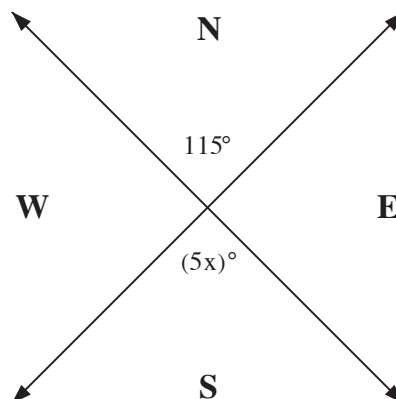
- ☐ A. $\angle LZU$
- ☐ B. $\angle FZX$
- ☐ C. $\angle XZU$
- ☐ D. $\angle FZQ$



- b) What is the student's likely error?

- ☐ A. $\angle FZU$ is complementary to $\angle QZG$.
- ☐ B. $\angle FZU$ and $\angle QZG$ are not formed by two intersecting lines.
- ☐ C. $\angle FZU$ is not opposite $\angle QZG$.
- ☐ D. $\angle FZU$ is supplementary to $\angle QZG$.

8. **Intersection** While visiting your friend in the city, you see two roads that intersect as shown. Your friend tells you that the angle between the roads on the north side is 115° and the angle between the roads on the south side is $(5x)^\circ$. Find the value of x .

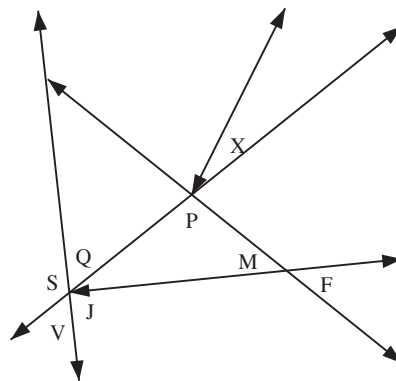


(The figure is not shown to scale.)

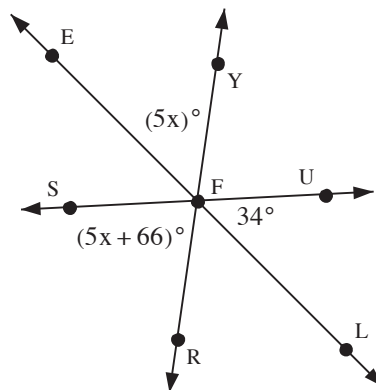
9. a) **Multiple Representations** Check all the angle pairs that are vertical angles.

- ☐ A. $\angle F$ and $\angle M$
- ☐ B. $\angle Q$ and $\angle V$
- ☐ C. $\angle X$ and $\angle P$
- ☐ D. $\angle S$ and $\angle J$

b) Describe an instance where you see vertical angles every day.



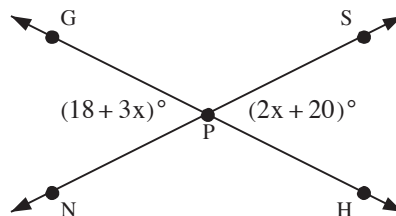
10. Find the value of x .



(The figure is not shown to scale.)

11. a) **Challenge** Find the value of x .

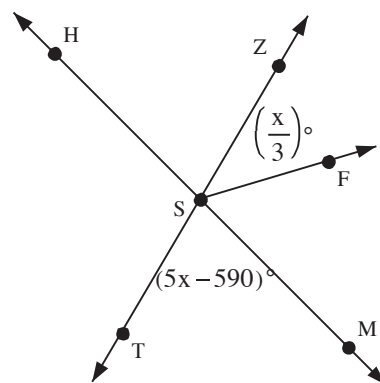
- b) What is the measure of $\angle GPN$?
- c) What is the measure of $\angle SPH$?
- d) What is the measure of $\angle GPS$?
- e) What is the measure of $\angle NPH$?



(The figure is not shown to scale.)

12. **Challenge** In the figure, $\angle HSZ$ is vertical to $\angle TSM$.

- a) Find the value of x given that $m\angle HSF = 130^\circ$.
- b) Find $m\angle HSZ$.
- c) Find $m\angle TSM$.
- d) Find $m\angle HST$.
- e) Find $m\angle ZSF$.
- f) Find $m\angle FSM$.



(The figure is not shown to scale.)