12-1B Lesson Master

VOCABULARY
In 1 and 2, refer to the parabola at the right.

1. Identify the following.
   a. focus ____________________
   b. directrix ____________________
   c. vertex ____________________
   d. axis of symmetry ____________________

2. Explain what is true about all the points on the parabola.

   ____________________
   ____________________
   ____________________

SKILLS Objective B
In 3–9, write an equation for the parabola with the given focus and directrix.

3. focus (0, -4); directrix \( y = 4 \) ____________________
4. focus (0, 3); directrix \( y = -3 \) ____________________
5. focus (0, 7); directrix \( y = -7 \) ____________________
6. focus (0, 1); directrix \( y = -1 \) ____________________
7. focus (0, -5); directrix \( y = 5 \) ____________________
8. focus (0, -8); directrix \( y = 8 \) ____________________
9. focus (0, -2); directrix \( y = 2 \) ____________________

PROPERTIES Objective E
In 10–14, the equation of a parabola is given. Find the coordinates of the focus and vertex and an equation for the directrix.

10. \( y = -\frac{1}{5}x^2 \)
    focus: ______ vertex: ______ directrix: ______

11. \( y = 9x^2 \)
    focus: ______ vertex: ______ directrix: ______

12. \( y = -4(x + 2)^2 \)
    focus: ______ vertex: ______ directrix: ______
13. $y = 0.6x^2$
   focus: __________ vertex: __________ directrix: __________

14. $y - 1 = -3(x + 3)^2$
   focus: __________ vertex: __________ directrix: __________

15. The point $(2, \frac{1}{2})$ is on the parabola $y = \frac{1}{8}x^2$. Find the distance from $(2, \frac{1}{2})$ to
   a. the point $(0, 2)$. ______________________
   b. the line $y = -2$. ______________________

**PROPERTIES** Objective F

In 16–25, determine whether the figure described is a parabola.

16. The set of all points equidistant from $y = 2$ and $(3, 3)$. ______________

17. The set of all points equidistant from $(5, 0)$ and $(1, -4)$. ______________

18. The set of all points equidistant from $y = 2x + 5$ and $(1, 3)$. ______________

19. The set of all points equidistant from $y = 2 - x$ and $(5, -3)$. ______________

20. The set of all points equidistant from $(5, 0)$ and $y = -4$. ______________

21. The set of all points equidistant from $y = -\frac{3}{2}x - 3$ and $(-1, -3)$. ______________

22. The set of all points on the graph of $y = 3x^2 - 2x + 5$. ______________

23. The set of all points on the graph of $y - \frac{1}{2} = \frac{3}{5} (x - 8)$. ______________

24. The set of all points on the graph of $y = 8y^2 - 2x^2 + 5^2$. ______________

25. The set of all points on the graph of $y - 7 = 3(x - 8)^2$. ______________

**REPRESENTATIONS** Objective L

In 26 and 27, sketch the parabola with the given focus and directrix.

26. ______________

27. focus $(0, -1)$, directrix $y = 1$