

Name _____ Date _____ Per _____

State the direction of opening, vertex, focus, and directrix of the parabola with the given equation. Then graph the parabola.

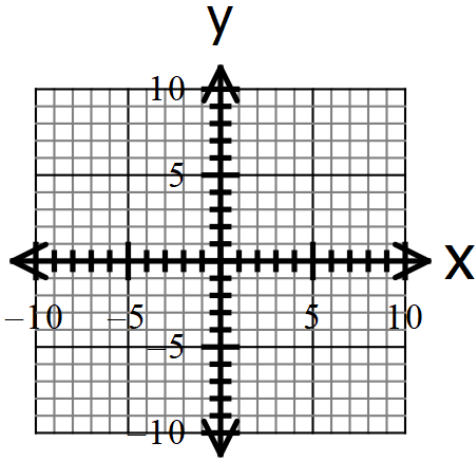
1. $x^2 = 12y$

direction of opening

vertex

focus

directrix



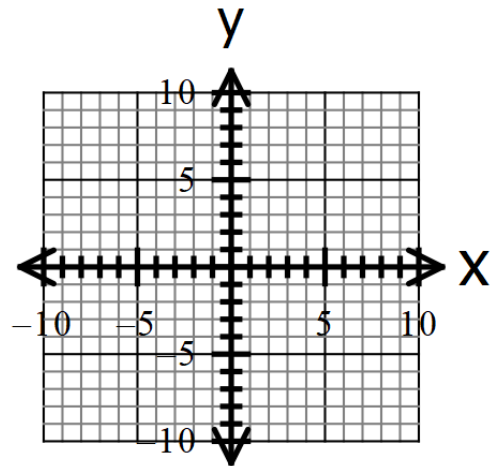
2. $y^2 = 8x$

direction of opening

vertex

focus

directrix



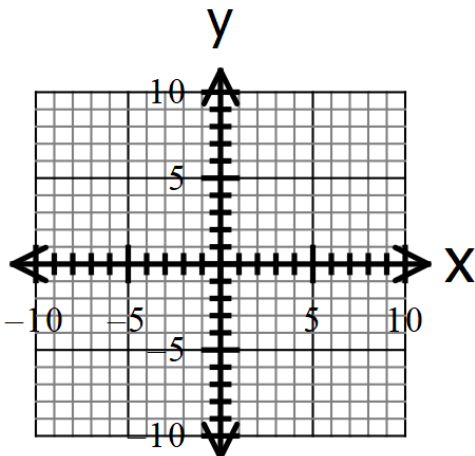
3. $y^2 = -16x$

direction of opening

vertex

focus

directrix



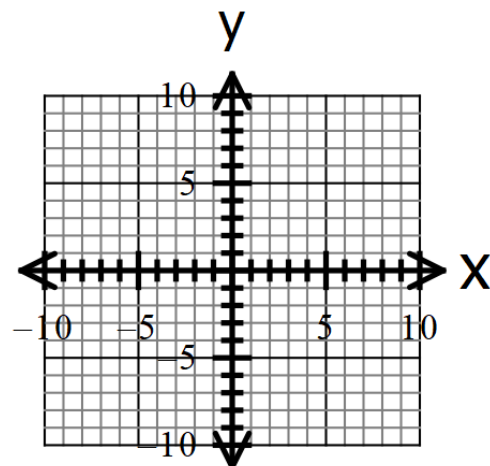
4. $x^2 = -20y$

direction of opening

vertex

focus

directrix



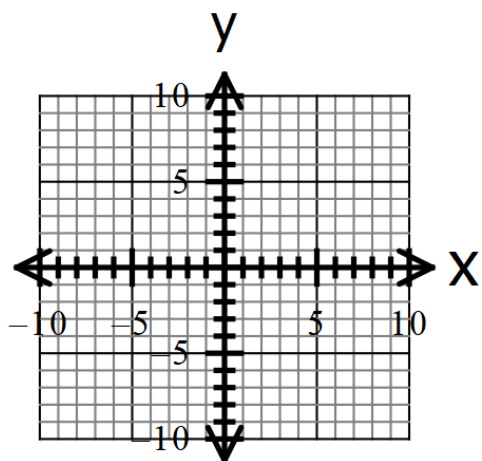
5. $(x-5)^2 = -4(y-1)$

direction of opening

vertex

focus

directrix



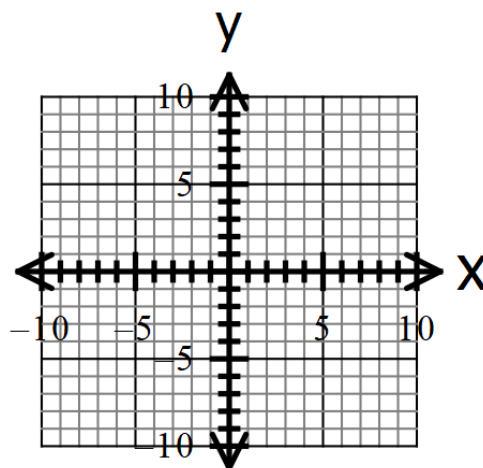
6. $(y+3)^2 = -8(x-6)$

direction of opening

vertex

focus

directrix



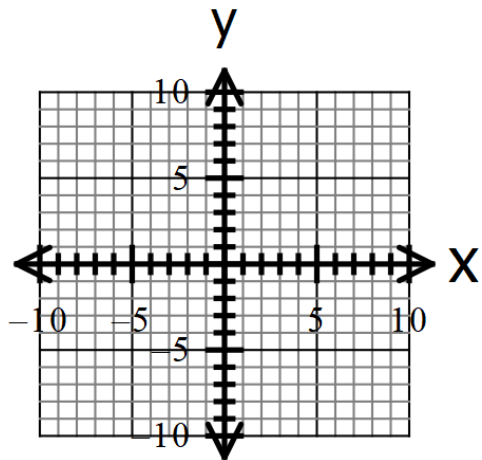
7. $(y-2)^2 = 16(x+1)$

direction of opening

vertex

focus

directrix



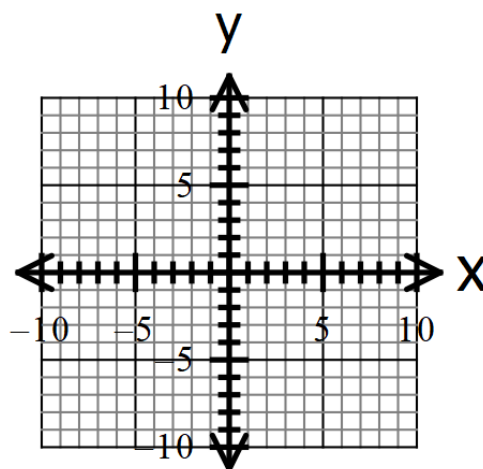
8. $(x+3)^2 = 6(y+2)$

direction of opening

vertex

focus

directrix



Convert each equation to standard form by completing the square. State the direction of opening, vertex, focus, and directrix of the parabola. Then graph the parabola.

9. $x^2 - 12x + 4y + 48 = 0$

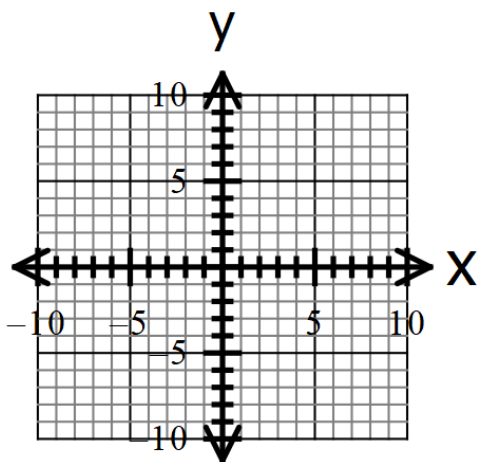
10. $x^2 + 6x + 8y + 1 = 0$

direction of opening

vertex

focus

directrix

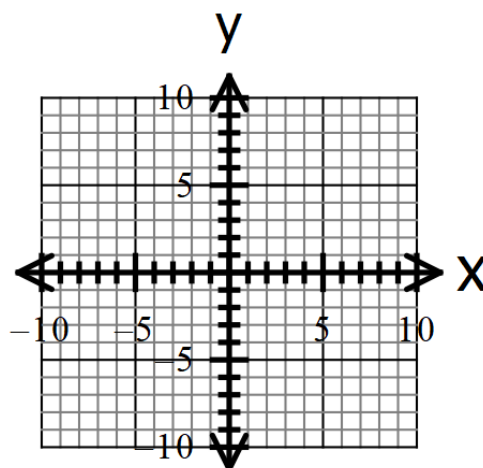


direction of opening

vertex

focus

directrix



11. $y^2 - 2y + 12x - 35 = 0$

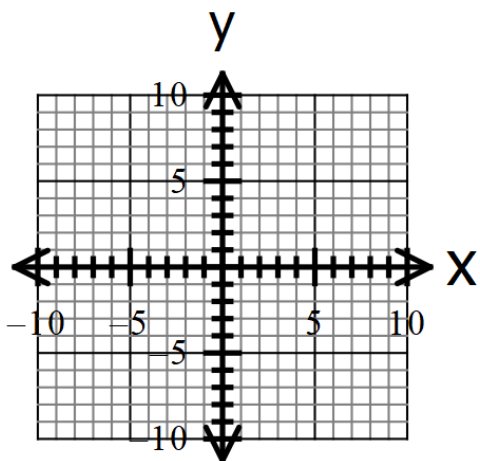
12. $y^2 + 8y - 4x + 8 = 0$

direction of opening

vertex

focus

directrix

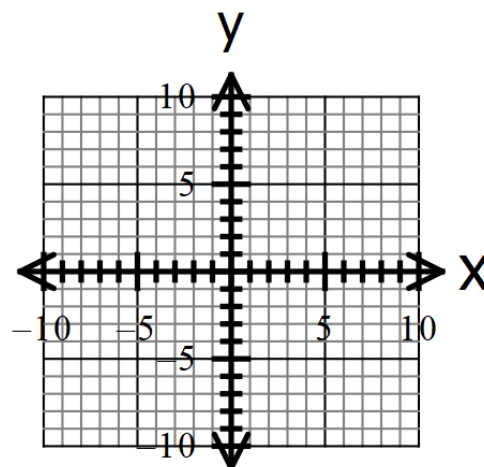


direction of opening

vertex

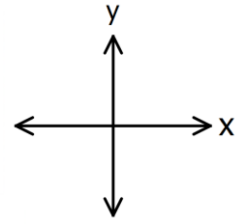
focus

directrix

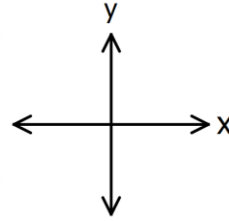


Write the equation in standard form for the parabola with the given features.

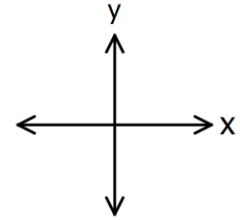
13. Vertex: $(0,0)$, Focus: $(-7,0)$



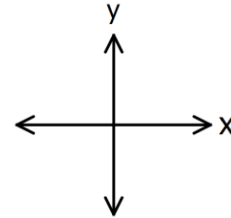
14. Vertex: $(0,0)$, Directrix: $y = 8$



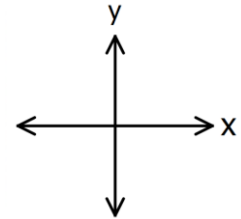
15. Focus: $(-5,8)$, Directrix: $y = 2$



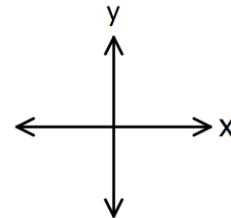
16. Vertex: $(2,-3)$, Focus: $(2,-5)$



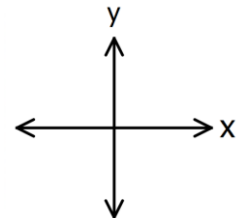
17. Vertex: $(7,-1)$, Directrix: $x = -1$



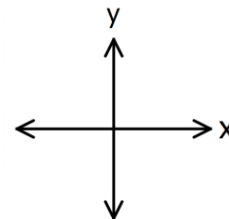
18. Focus: $(3,2)$, Directrix: $x = -1$



19. Vertex: $(0,0)$, Axis of symmetry: x -axis, passes through $(-2,6)$



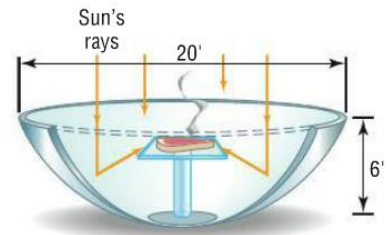
20. Vertex: $(-2,4)$, Axis of symmetry: $x = -2$, passes through $(0,5)$



Solve the problem.

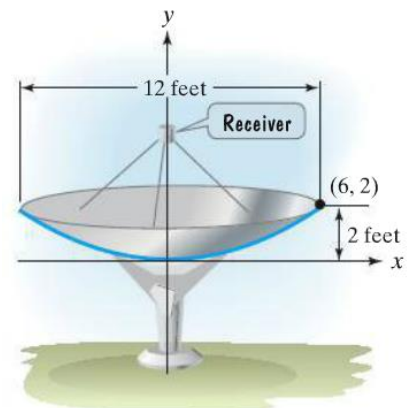
21. The reflector of a flashlight is in the shape of a paraboloid of revolution. Its diameter is 4 inches and its depth is 1 inch. How far from the vertex should the bulb be placed so that the rays will be reflected parallel to the axis?

22. A mirror is shaped like a paraboloid of revolution and will be used to concentrate the rays of the sun at its focus, creating a heat source. If mirror is 20 feet across at its opening and is 6 feet deep, where will heat source be concentrated?

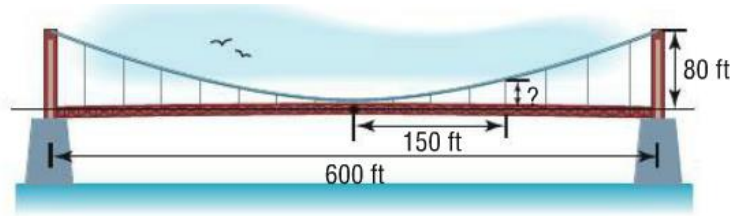


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23. A satellite dish is in the shape of a paraboloid of revolution. Signals coming from a satellite strike the surface of the dish and are reflected to the focus, where the receiver is located. The satellite dish has a diameter of 12 feet and a depth of 2 feet. How far from the base of the dish should the receiver be placed?



24. The cables of a suspension bridge are in the shape of a parabola. The towers supporting the cable are 600 feet apart and 80 feet high. If the cables touch the road surface midway between the towers, what is the height of the cable from the road at a point 150 feet from the center of the bridge?



25. A bridge is built in the shape of a parabolic arch. The bridge has a span of 120 feet and a maximum height of 25 feet. Find the height of the arch at distances of 10, 30, and 50 feet from the center.

