

Answer each question.

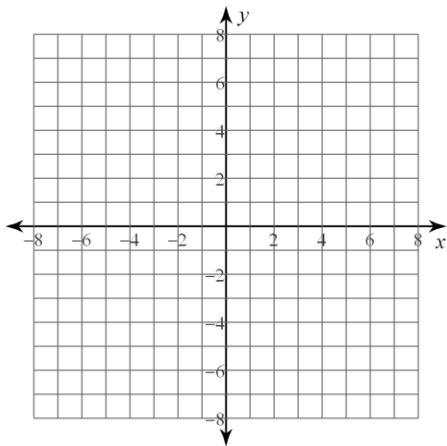
1.  $y$  varies directly with  $x$ . If  $y = -4$  when  $x = 2$ , find  $y$  when  $x = -6$ .
2.  $y$  varies inversely with  $x$ . If  $y = 40$  when  $x = 16$ , find  $x$  when  $y = -5$ .
3.  $y$  varies jointly with  $x$  and  $z$ . If  $y = 12$  when  $x = 2$  and  $z = 3$ , find  $z$  when  $y = 24$  and  $x = 2$ .
4. The electric current  $I$ , in amperes, in a circuit varies directly as the voltage  $V$ . When 12 volts are applied, the current is 4 amperes. What is the current when 18 volts are applied?
5. The number of kilograms of water in a person's body varies directly as the person's mass. A person with a mass of 90 kg contains 60 kg of water. How many kilograms of water are in a person with a mass of 50 kg?
6. The volume  $V$  of gas varies inversely to the pressure  $P$ . The volume of a gas is  $200 \text{ cm}^3$  under pressure of  $32 \text{ kg/cm}^2$ . What will be its volume under pressure of  $40 \text{ kg/cm}^2$ ?
7. The time it takes to fly from Los Angeles to New York varies inversely as the speed of the plane. If the trip takes 6 hours at 900 km/h, how long would it take at 800 km/h?
8. The cost of pipe at Lowe's varies jointly as the length and diameter of the pipe. If 20 feet of 0.5 inch diameter pipe costs \$36.60, then what is the cost of 12 feet of 0.75 inch diameter pipe?

9. Disregarding wind resistance, the distance a body falls from rest varies directly as the square of the time it falls. If a skydiver falls 64 feet in 2 seconds, how far will he fall in 10 seconds?

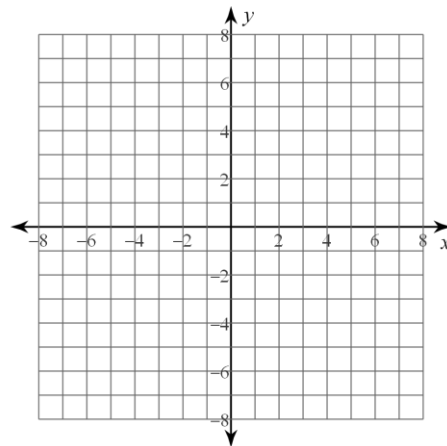
10. The force of the wind blowing on a vertical surface varies jointly as the area of the surface and the square of the velocity. If a wind blowing at 50 mph exerts a force of 75 pounds on a surface of 500 ft<sup>2</sup>, how much force will a wind of 75 mph place on a surface of 10 ft<sup>2</sup>?

Graph each function.

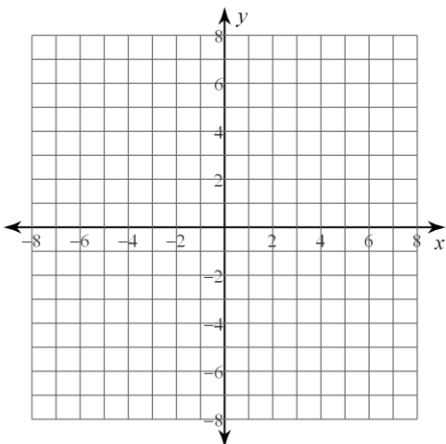
11.  $f(x) = \frac{4}{x}$



12.  $f(x) = \frac{1}{x-2} - 1$



13.  $f(x) = \frac{3}{x+2} - 1$



14.  $f(x) = -\frac{4}{x-1} + 2$

