

1. The intensity of light, measured in lux, is inversely proportional to the square of the distance from the object being illuminated. A light meter 6.4 m from a light source registers 30 lux. What intensity would it register 16 m from the light source?
2. If x varies jointly as y and the square root of z , and $x = 20$ when $y = 5$ and $z = 9$, find x when $y = 6$ and $z = 25$.
3. The kinetic energy of an object varies jointly as the mass and the square of the speed. The kinetic energy of an object with mass 3kg and speed 4 m/s is 24 joules. Find the kinetic energy of an object with mass 4 kg and speed 3 m/s.
4. If z varies directly as the square of x and inversely as y , and $z = 8$ when $x = 4$ and $y = 6$, find z when $x = 6$ and $y = 12$.
5. Divide, using synthetic division.

a.
$$\frac{x^3 + 2x^2 - 2x - 4}{x + 1}$$

b.
$$\frac{x^6 - 3x^5 + 14x + 4}{x - 2}$$

c.
$$\frac{2x^4 - 7x^3 - x + 10}{x - 3}$$