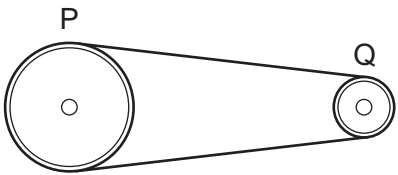


12 The diagram shows two pulley wheels connected by a belt.



Wheel Q is driven by a motor and rotates clockwise at a constant rate. Wheel Q puts tension in the top portion of the belt, which in turn drives the wheel P. The lower portion of the belt is slack and has no tension. The weight of the belt and frictional forces are negligible.

The diameter of P is 150 mm. The diameter of Q is 100 mm. The torque applied to Q is 3.0 N m.

What is the tension in the belt and the torque on wheel P?

	tension in top of belt / N	torque on wheel P / N m
<b>A</b>	20	2.0
<b>B</b>	30	4.5
<b>C</b>	40	2.0
<b>D</b>	60	4.5

13 A projectile is launched at  $45^\circ$  to the horizontal with initial kinetic energy  $E$ .

Assuming air resistance to be negligible, what will be the kinetic energy of the projectile when it reaches its highest point?

- A**  $0.50 E$       **B**  $0.71 E$       **C**  $0.87 E$       **D**  $E$

**Space for working**