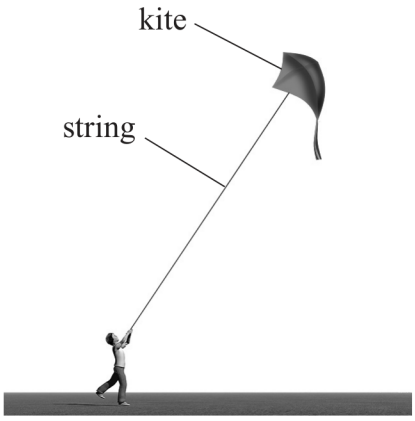
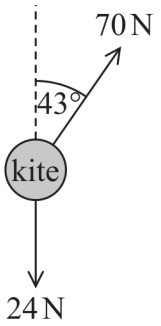
16 A student is flying a kite. The kite is held in equilibrium by a string as shown.



(Source: © CAROL & MIKE WERNER/SCIENCE PHOTO LIBRARY)

The weight of the kite is 24 N, and the wind exerts a force of 70 N at an angle of 43° to the vertical, as shown below.



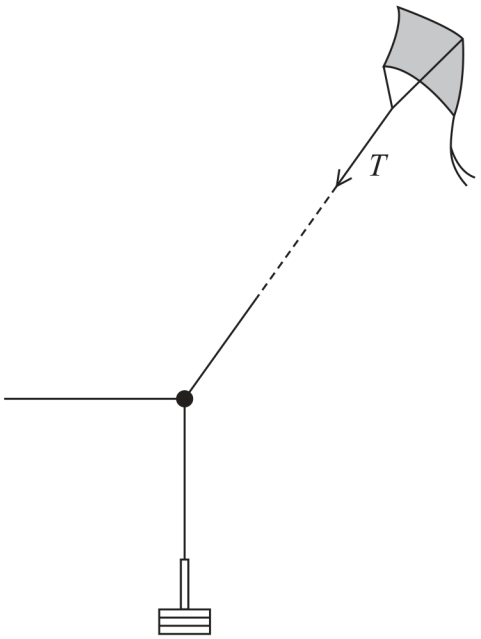
NOT TO SCALE

(a) Determine the magnitude of the tension in the string by using a scaled vector diagram.

(4)

Tension = ...

(b) The student wants to determine the tension T in the string. She attaches a mass holder to the string. The student adds known masses to the mass holder until the kite is in equilibrium and part of the string becomes horizontal, as shown.



The student takes a photograph of the arrangement.

Describe how the student can use the photograph to determine T.

(5)

(Total for Question 16 = 9 marks)