

Box dragged at an angle numericName _____

Answers:

1. box is moving
2. box is picked up
3. box is moving
4. box is not moving

number 1:

$$F_g = 117.6 \text{ N}$$

$$F_x = 82.272 \text{ N}$$

$$F_y = 47.5 \text{ N}$$

$$F_n = 70.1 \text{ N}$$

max static friction = 42.06 N, this force is overcome by the forward force so the box moves

$$F_{fr} = 21.03$$

$$\text{net force} = 61.242 \text{ N}$$

$$\text{acceleration} = 5.10 \text{ m/s}^2$$

number 2:

$$F_g = 78.4 \text{ N}$$

$$F_x = 30.78 \text{ N}$$

$$F_y = 84.57 \text{ N}$$

box is lifted off the ground because the upward force is greater than gravity

number 3:

$$F_g = 98 \text{ N}$$

$$F_x = 56.38 \text{ N}$$

$$F_y = 20.52 \text{ N}$$

$$F_n = 77.48 \text{ N}$$

max static friction = 38.74, the box moves because the forward force exceeds this force

$$F_{fr} = 15.496$$

$$\text{net force} = 40.884 \text{ N}$$

$$\text{acceleration} = 4.09 \text{ m/s}^2$$

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number 4:

$$F_g = 117.6 \text{ N}$$

$$F_x = 61.065 \text{ N}$$

$$F_y = 72.774 \text{ N}$$

$$F_n = 44.826 \text{ N}$$

max static friction = 26.8956, the box moves because the forward force exceeds this force

$$F_{fr} = 17.903 \text{ N}$$

$$\text{net force} = 43.162 \text{ N}$$

$$\text{acceleration} = 3.60 \text{ N}$$