6.2 Dot Product of Vectors (continued)
Target 8D: Apply properties of vectors to real life situations

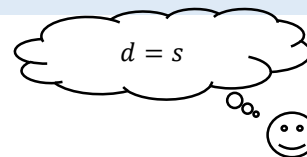*Review of Prior Concepts*

1. Given $\vec{u} = \langle 5,2 \rangle$ and $\vec{v} = \langle -4,3 \rangle$, find the angle between the two vectors.

2. Find the value of x that would make $\vec{u} = \langle 5,2 \rangle$ and $\vec{v} = \langle x, 3 \rangle$ orthogonal.

Work

$$\text{Work} = \text{Force} \cdot \text{Distance}$$
$$W = F \cdot d$$

$d = s$

Examples:
1. Abigail lifts a book that weighs 2 lbs from the floor onto a shelf that is 4 feet high. How much work did she do?

2. Juan is sitting on a desk. The combined weight of Juan and the desk is 155 pounds. How much work must Oswaldo do to lift Juan and the desk 6 ft high?

3. How much work must Karen do to life a 100 pound sack of potatoes 3 feet?

Work & Force with Angular Direction Examples

1. Jose is sitting on a sled on the side of a hill that is inclined at a 35° angle. Jose and the sled weigh 140 lbs. Alejandro needs to use what force to pull Jose up the hill?

2. Mandy is pulling a box up a hill that weighs 20 lbs. The hill is at a 75° angle. What force does she need to use?

3. Oscar is dragging his luggage through the airport at an angle of 65° with a force of 400N over a distance of 47m. How much work did he do?

4. Find the work done by a 10 pound force acting in the direction $\langle 1,2 \rangle$ in moving an object 3 feet from (0,0) to (3,0).

More Practice

Work & Force

https://www.varsitytutors.com/hotmath/hotmath_help/topics/solving-problems-with-vectors

https://www.khanacademy.org/math/precalculus/vectors-precalc/applications-of-vectors/v/vector-component-in-direction

http://www.physicsclassroom.com/class/energy/Lesson-1/Calculating-the-Amount-of-Work-Done-by-Forces

https://www.mansfieldct.org/Schools/MMS/staff/hand/work=fxd.htm

http://www.uwgb.edu/fenclh/problems/energy/1/

https://youtu.be/WSY4HzWZIlo

https://youtu.be/tZOBPEwshb8

https://youtu.be/EKyWQKi76uo

Homework Assignment
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