

T5.1 – Vector Equations

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(A) Algebra with Vectors

- In working with vectors algebraically, we can:
 - (1) addition/subtraction vectors
 - (2) scalar multiplication of vectors
- Today, we will NOT use component form as we work with vector equations

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(A) Algebra with Vectors

- To help make our algebra work with vectors easier, let's make certain generalizations (rules) that are true for vector algebra
 - Commutative property $\rightarrow a + b = b + a$
 - Associative property $\rightarrow (a + b) + c = a + (b + c)$
 - Additive identity property $\rightarrow a + 0 = 0 + a = a$
 - Additive inverse property $\rightarrow a + (-a) = (-a) + a = 0$
- Distributive property of multiplication $\rightarrow (k + m)a = ka + ma$
- Distributive property of multiplication $\rightarrow k(a + b) = ka + kb$

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(A) Algebra with Vectors

- Since we can “do algebra” with vectors, let's apply our various algebra rules to equations with vectors
 - So, for example:
 - solve the vector equation $2x = a$ for x
 - Explain what the equation and the solution MEAN?
 - Graphically represent the question and the answer

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(A) Algebra with Vectors

- So, for example:
- solve the vector equation $x + a = b$ for x
- Explain what the equation and the solution MEAN?
- Graphically represent the question and the answer

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(A) Algebra with Vectors

- So, for example:
- solve the vector equation $4x + 5a = b$ for x
- Explain what the equation and the solution MEAN?
- Graphically represent the question and the answer

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(A) Algebra with Vectors

- So, for example:
- Graph the vector equation $r = a + tb$
- Now t is a parameter and can change \rightarrow so let $t = 2$, $t = 4$ and $t = 6$.
- Graph the equation

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Homework

- CW
- Ex 15D #1,2,3
- Ex 16C #3,4

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