Precalculus: Vectors Notes

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| What is a *scalar*? | Examples of scalars: |
| What is a *vector*? | Examples of vectors: |

There are different ways to represent a vector.

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| Sketch the vector **v** with initial point (1, 5) and terminal point (-4, 3) | Find the *component form* of the vector **v** by subtracting the initial point from the terminal point. | Sketch the component vector of **v**. What is the relationship between the component vector and the initial vector? |
| To change to *linear combinations* form, use | | |

Try these:

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| EX 1: Draw a vector with **v** with initial point (2, 3) and terminal point (0, -5) | EX 2: Draw the vector given its component form  **w** = |
| EX 3: Draw the vector **v** given its linear combination form v = 2i + 5j | EX 4: Draw the vector **u** with a magnitude of 12 mph at 50° |
| Ex 5: Draw a vector with a magnitude of 8N at 15° east of north. | EX 6: Draw a vector with a magnitude of 20 km/h due south. |

Find the component form of a vector given its magnitude and direction: use

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| Ex 7: Find the component form of a vector with a magnitude of 30 mph at 40° | Ex 8: Find the component form of a vector with magnitude of 120N at 25°west of north. |

Find the magnitude and direction of a vector given its component form: use the formulas

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| To find magnitude, use the Pythagorean Theorem!  Magnitude: | To find direction use right triangle trig!  Direction:  If your angle is in Q1, use the value in your calculator.  If your angle is in Q2 or Q3, add 180°  If your angle is in Q4, add 360° |
| EX 9: Find the magnitude and direction of the vectors shown whose initial point is (1, 9) and whose terminal points is (8, -5) | |
| Ex 10: Find the magnitude and direction of the vector | |

Operations with vectors:

Vectors can be multiplied by a scalar, added and subtracted. These operations can change the magnitude and direction of the vector. The answer is called the *resultant*. Please keep consistent form.

Given the linear combinations form of the vector  and , find all the following:

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Given the component form of the vectors  and  , find all the following:

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