Visualizing Vectors
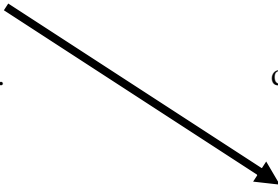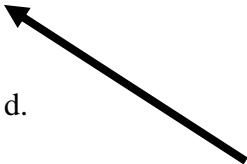
Vector Practice

Using your knowledge of Vectors, complete the following Vector problems. You may use your calculator, Pythagorean Theorem, Law of Cosines and the "Vector Thingy" to help you solve the questions.

1. The Magnitude of the Resultant between two vectors <u>increases</u> as the angle between the two vectors... (Hint… use your "Vector Thingy"!)

    a. increases   b. decreases

2. The Resultant between two Forces acting concurrently on the same point is at a maximum when the angle between the two Forces is… (Hint.. use your "Vector Thingy"!)

    a. 0 degrees   b. 45 degrees   c. 90 degrees   d. 180 degrees

3. Two vectors act concurrently on a point with an angle of 125 degrees between them. As the angle decreases to 40 degrees, the Resultant becomes… (Hint.. use your "Vector Thingy"!)

    a. larger   b. smaller   c. unchanged

4. Two Vectors of 50N and 60N act concurrently on a point with an angle of 70 degrees between them. Using the Parallelogram Method of Vector Addition and the Law of Cosines ($c^2 = a^2 + b^2 - 2abCosC$), Find…

    a. …the Supplementary angle (in degrees) for Angle C.
        (Hint.. your "Vector Thingy" will help!)

    b. …the Resultant

5. Which Vector best represents the Resultant of Forces F1 and F2 acting on Point P? (Hint.. use your "Vector Thingy"!)

P   F1

F2
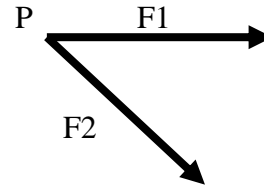
a.   b.   c.   d.

6. Which Vector best represents the Resultant of Forces F1 and F2 acting on Point P? (Hint.. use your "Vector Thingy"!)

a.   b.   c.   d.

7. Two Vectors of 30N and 80N act concurrently on a point with an angle of 150 degrees between them. Using the Parallelogram Method of Vector Addition and the Law of Cosines ($c^2 = a^2 + b^2 - 2abCosC$), Find…

     a. …the Supplementary angle (in degrees) for Angle C.
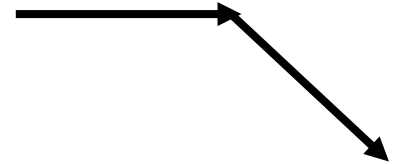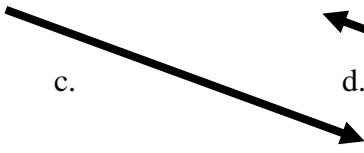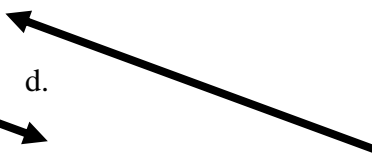   (Hint.. your "Vector Thingy" will help!)

     b. …the Resultant

8. The resultant of a 12N force and a 7N force is 5N. The angle between the two forces is…
     (Hint.. your "Vector Thingy" will help!)

     a. 0 degrees   b. 45 degrees   c. 90 degrees   d. 180 degrees

9. Two concurrent Forces of 30N each act to produce a Resultant whose Magnitude is 60N. The Angle between these two forces MUST be… (Hint.. use your "Vector Thingy"!)

    a. 0 degrees.   b. 60 degrees   c. 90 degrees.   d. 120 degrees   e. 180 degrees

10. Using **Vector a** (300 mm) and **Vector b** (220 mm) values on your "Vector Thingy", Find the Resultant for…

    10A. Vector a and Vector b @ 90 degrees. $(c^2 = a^2 + b^2)$

    10B. Vector a and Vector b @ 40 degrees. $(c^2 = a^2 + b^2 - 2abCosC)$,

    10C. Vector a and Vector b @ 140 degrees. $(c^2 = a^2 + b^2 - 2abCosC)$,

11. For Question 10A, after **CALCULATING** the Resultant, **MEASURE** the Resultant (…the RED "sliding" arrow) on the "Vector Thingy" using a metric ruler and compare the results. Using the **CALCULATED** answer and the **MEASURED** answer , find the **Percent Error**.
        (Measure from the Concurrent Point (…the silver nut) to the tip of the RED arrow)

12. For Question 10B, after **CALCULATING** the Resultant, **MEASURE** the Resultant (…the RED "sliding" arrow) on the "Vector Thingy" using a metric ruler and compare the results. Using the **CALCULATED** answer and the **MEASURED** answer , find the **Percent Error**.
    (Measure from the Concurrent Point (…the silver nut) to the tip of the RED arrow)

13. For Question 10C, after **CALCULATING** the Resultant, **MEASURE** the Resultant (…the RED "sliding" arrow) on the "Vector Thingy" using a metric ruler and compare the results. Using the **CALCULATED** answer and the **MEASURED** answer , find the **Percent Error**.
    (Measure from the Concurrent Point (…the silver nut) to the tip of the RED arrow)

14. The "Vector Thingy" is not manufactured to display a 180 degree angle between Vectors a & b. Given the two Vectors, a & b, what would the Resultant be if the angle between the two Vectors was at 180 degrees?

15. The "Vector Thingy" is ALSO not manufactured to display a zero degree angle between Vectors a & b. Given the two Vectors, a & b, what would the Resultant be if the angle between the two Vectors was at zero degrees?