**IB Physics**

Vector Sheet

Directions: make no marks on this sheet. **Do these problems on your own paper**, check your answer on the side. The answers are on the left side, but practice not looking at them until you have arrived at an answer yourself. Especially tricky are + and -, and switching x and y.

**Part 1 - Convert these Angle-Magnitude vectors on the right to Vector-Component vectors. (answers at the left)**

|  |  |
| --- | --- |
| 1. 13 m/s**x** + 7.3m/s**y**2. 230m**x** + 190m**y**3. 18.6m/s**x** -26.6m/s**y**4. -73.8m/s**x** - 94.6 m/s**y**5. -126m**x** + 40.8m**y**6. -140m/s/s**x** - 80.m/s/s**y** | 38o4) 120.0 m/s m/s35o3) 32.5 m/s40o2) 300. m29o1) 15 m/s30.o6) 160 m/s/s5) 132 m18.0o |

**Part 2 - Convert these Vector-Component vectors on the right into Angle-Magnitude vectors. Find always the Trig. angle (ACW from the x axis)**

|  |  |  |
| --- | --- | --- |
| 7. 7.8 m, 50.o8. 7.62 m, 113.2o | 7. 5.0 m**x** + 6.0 m**y** | 8. -3.00 m**x** + 7.00 m**y** |
| 9. 5.3 m, 217o10. 5.81 m, 281.1o | 9. -4.2 m**x** -3.2 m**y** | 10. 1.12 m**x** - 5.70 m**y** |

**Part 3 - Add or Subtract these Vector component vectors from Part 2**

|  |  |  |
| --- | --- | --- |
| 11. 2.0m**x** + 13.0m**y**12. 8.0m**x** - 1.0m**y** | 11. #7 + #8 | 12. #7 - #8 |
| 13. -1.2m**x** - 10.2m**y**14. -3.1m**x** - 8.9m**y** | 13. #9 - #8 | 14. #10 + #9 |

**Part 4 - Multiply these vectors by these scalars.**

|  |  |  |
| --- | --- | --- |
| 15. 49m**x** + 27m**y**16. 2.1m/s**x** + 1.7m/sm**y** | 15. You have the velocity of 13 m/s**x** + 7.3m/s**y**  for 3.75 seconds. What is your displacement in VC notation? | 16. You undergo the displacement of 230m**x** + 190m**y** in 112 seconds. What is your velocity in VC notation? |
| 17. -91m/s**x** - 105m/s**y**18. 5.52m/s at 113o | 17. You have the initial velocity of -73.8m/s**x** - 94.6 m/s**y**, and you accelerate like -140m/s/s**x** - 80.m/s/s**y** for .126 seconds. What is your final velocity? | 18. You undergo the displacement as in #8 in 1.38 seconds. What is your velocity in AM notation? |

**Part 5 - Add these Angle-Magnitude vectors analytically, and express their sum as an Angle-Magnitude Vector.**

|  |  |
| --- | --- |
| (Answer: 18m, 352.3o Trig Angle) | (Answer: 44m, 329o Trig Angle) |