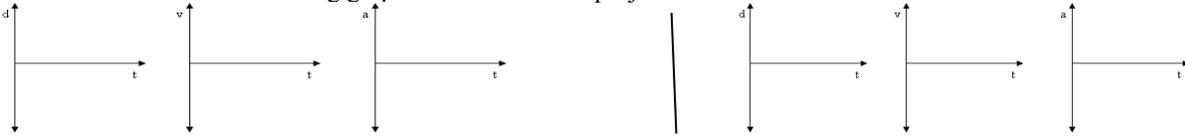


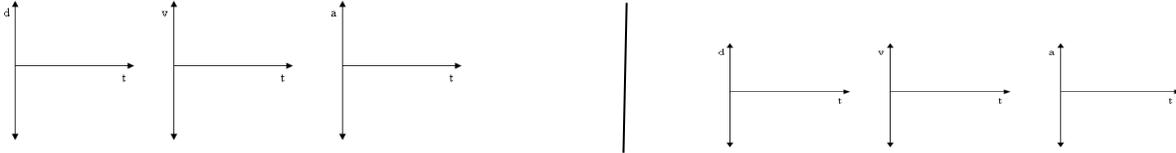
REVIEW SHEET – Vectors and Two Dimensional Motion

1. Read Chapter 3
2. **Terms to know:** concurrent vectors, component vectors, resultant vector, trajectory, projectile, range, half-time.
3. You should be able to . . .
 - a) add two vectors together by the scale method and the mathematical method.
 - b) find the resultant vector from two concurrent vectors.
 - c) find the components of a resultant vector by the scale method and the mathematical method.
 - d) sketch vectors representing the velocity and acceleration of a projectile at any point in its path.
4. A resultant vector is determined by finding its _____ and _____.
5. Which angle represents the direction of the resultant vector?
6. Compare the placement of the component vectors to the placement of the resultant vector.
7. What must be done to concurrent vectors before a resultant can be found?
8. As the angle between two concurrent vectors increases, what happens to the resultant vector?
9. What angle between two concurrent vectors gives
 - a) the maximum resultant?
 - b) the minimum resultant?
10. Two forces of 50 N and 30 N act concurrently. What is range of possible values for the magnitude of the resultant?
11. As the angle a vector makes with the horizontal increases, what happens to the
 - a) horizontal component?
 - b) vertical component?
12. Describe the horizontal and vertical motion of a projectile.
13. A rock is thrown horizontally from the top of a tall cliff at 5.0 m/s at the same time an identical rock is dropped. Neglecting air resistance, compare for the two rocks
 - a) the time taken to hit the ground.
 - b) the initial velocity in the horizontal direction.
 - c) the initial velocity in the vertical direction.
 - d) the horizontal acceleration.
 - e) the vertical acceleration.

14. Sketch the following graphs for a horizontal projectile in both the horizontal and vertical directions.



15. A football is kicked at an angle of 30° to the horizontal. Sketch the following graphs for the football in both the horizontal and vertical directions.



16. As the angle of launch of a football increases, what happens to the horizontal and vertical components of its initial velocity?

17. What angle(s) of launch gives

- the largest range?
- the longest flight time?
- the greatest altitude?
- the same range?

18. A stone is thrown horizontally at 15.0 m/s from the top of a cliff 78.4 m high.

- How long does it take the stone to reach the bottom of the cliff?
- How far from the base of the cliff does the stone strike the ground?
- What are the X and Y components of the velocity of the stone just before it strikes the ground?
- What is the magnitude of the velocity of the stone just before it hits the ground?

19. A player kicks a football from ground level at 27.0 m/s at an angle of 30.0° above the horizontal.

Calculate:

- The x and y components of the initial velocity.
- The time the ball is in the air.
- The distance the ball travels before it hits the ground.
- The maximum height it reaches.