- a. What is the car's final velocity?
- b. How far does the car travel during this time?
- c. After the car reaches its final speed (part a.) it begins to slow down and comes to rest in 1 minute. What is the car's acceleration as it comes to rest?

2. What acceleration is necessary for a boat to increase its speed from 13 m/s to 26 m/s over a distance of 1.25 km? Is this acceleration positive or negative? Explain.

- 3. A car traveling at 8 m/s slows to a stop in 5 seconds. How far does the car travel over this time interval? What was the car's acceleration?
- 4. The velocity graph for a truck is shown in the graph to the right.
 - a. Describe the motion in words.



- b. What was the acceleration of the truck?
- c. How far did the truck travel in the time shown?
- d. At what time would the truck finally stop (assuming it maintained the acceleration.)

5. A pebble is dropped from the top of a 12 m high bridge. How fast is the pebble moving when it hits the ground? How long does it take the pebble to hit the ground?

6. Make the height and velocity graphs that correspond to the motion in question 5.

7. Akansha jumps into the air with a speed of 2.3 m/s. How high does she jump? How long is she in the air?

8. Make the height and velocity graphs that correspond to the motion in question 7.

- 9. Is it possible to have a constant acceleration and also have a velocity of 0? Explain.
- 10. A pumpkin is thrown straight \underline{down} from a height of 25 meters. It hits the ground in only 1.7 seconds.
 - a. What was the initial velocity of the pumpkin?
 - b. What was the velocity of the pumpkin just as it hits the ground?
- 11. Imagine you throw a ball straight up in the air and catch it at the same height from which it was thrown.
 - a. Compare the time it takes the ball to go up to the time it takes the ball to come down.
 - b. Because the ball goes up and down, it will be at a particular height twice. Compare the speeds of the ball at those two different times.
 - c. Compare the velocities of the ball when it is at the same height.
 - d. What is the speed of the ball at its maximum height?
 - e. What is the velocity of the ball at its maximum height?

- f. What is the acceleration of the ball while going up?
- g. What is the acceleration of the ball while coming down?
- h. What is the acceleration of the ball at its maximum height?
- i. Was the velocity of the ball constant?
- j. Was the acceleration of the ball constant?
- 12. A ball is launched straight up and is in the air for a total of 3 seconds. How high does it go and with what speed was it launched?

13. An object is tossed straight up in the air. Fill in the missing numbers on the graphs.



- b. From what height was the arrow fired?
- What does the negative sign mean in the initial velocity? c.

Linear Motion II Exam Review (CP)

Answers:

1. a) 51 m/s b) 428 m c) -0.85 m/s²

- 2) $a = 0.20 \text{ m/s}^2$; it's positive because it is going forwards and speeding up
- 3) a = -1.6 m/s² & d = 20 m
- a) an object has an initial velocity of 12 m/s and slows to a final speed of 4 m/s in a time of 18 seconds (with a constant acceleration.)
 b) -0.44 m/s²
 c) 144 m
 d) 27 s
- 5) t = 1.55 s & v = -15.5 m/s (so actually, its speed is 15.5 m/s)
- 6)
- 7) t = 0.46 s & d = 0.265 m
- 8)
- 9) Of course! But not a constant velocity of 0 only at one point in time. This happens when something has been tossed up in the air at its maximum height is velocity is 0, but it is still constantly accelerating because of gravity.
- 10. a) -6.2 m/s b) -23.2 m/s
- 11. a) $t_{up} = t_{down}$ b) speeds the same (but opposite velocities) c) opposite
- d) 0 m/s e) 0 m/s f) -10 m/s² g) -10 m/s² h) -10 m/s² i) no j) yes
- 12) $v_i = 15 \text{ m/s} \& d = 11.25 \text{ m}$
- 13) on the graphs: $v_f = -8 \text{ m/s}$; $t_{top} = 0.8 \text{ s}$; $t_{total} = 1.6 \text{ s}$; $Y_{max} = 3.2 \text{ m}$
- 14. a) -37 m/s b) 23.5 m c) it was fired DOWN