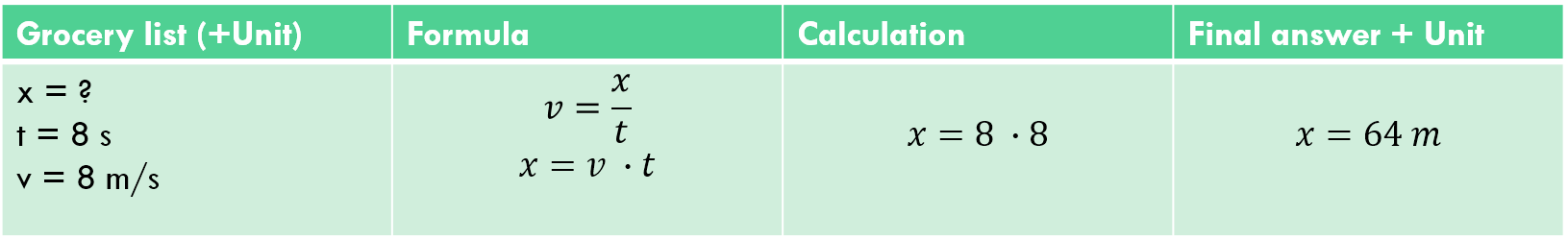
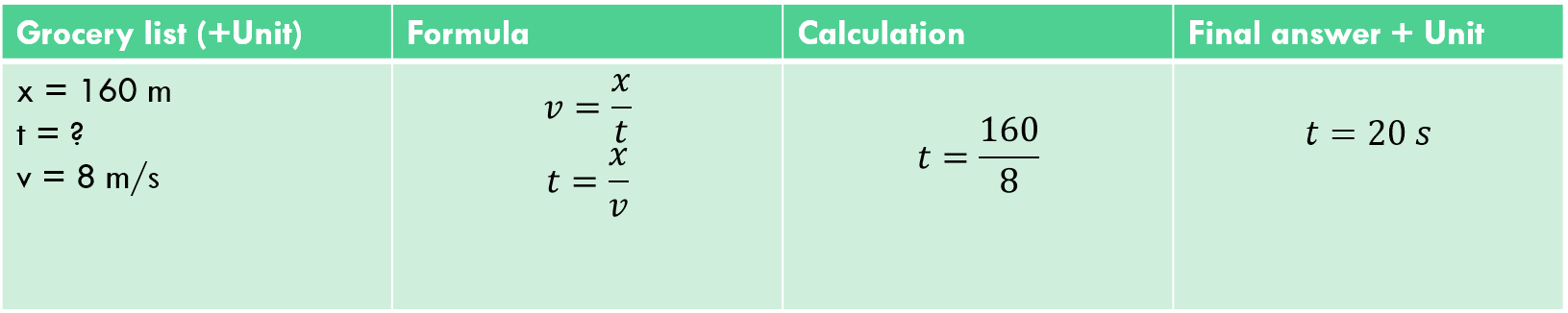


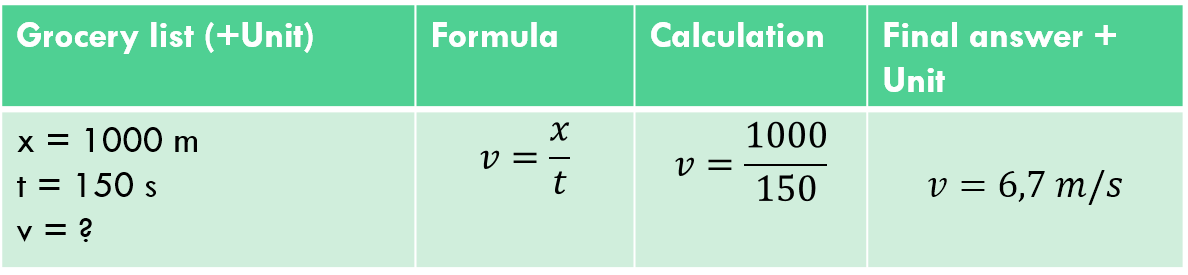
Page 27 Q1

Page 27 Q3

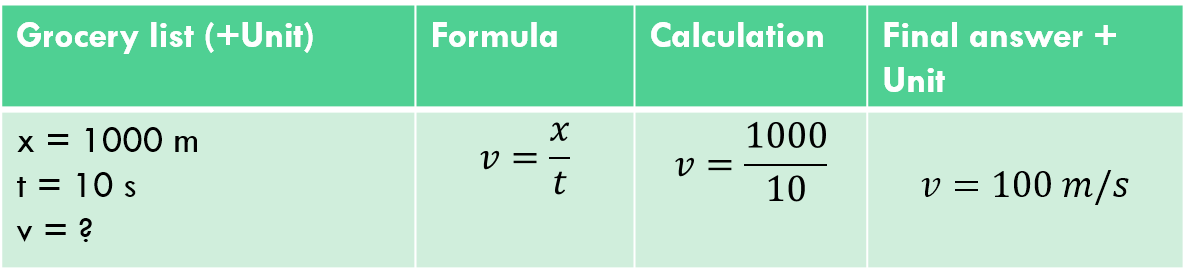




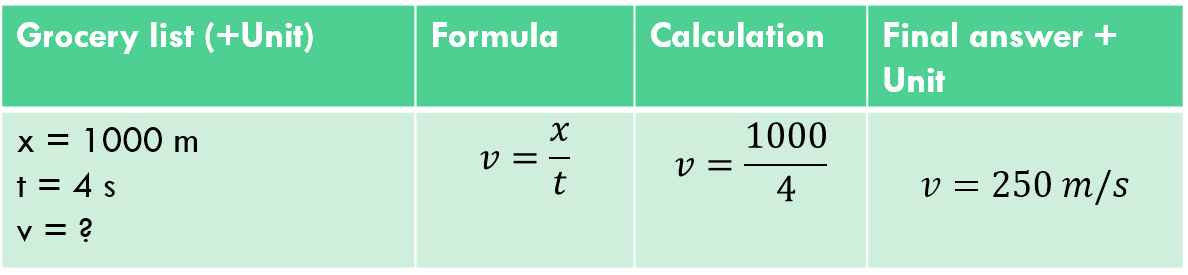
Page 27 Q4



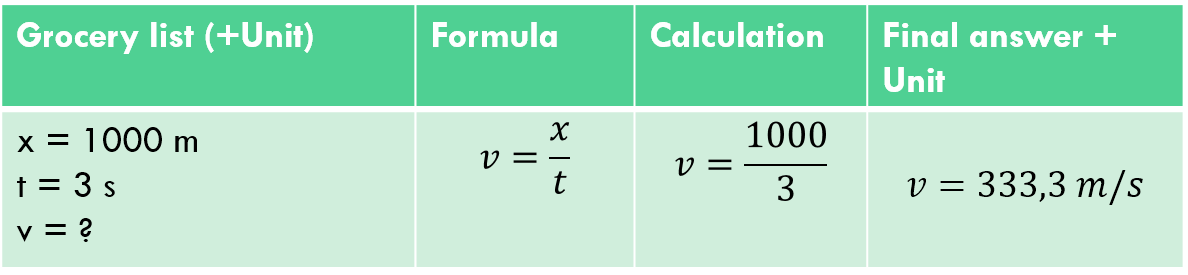
Runner



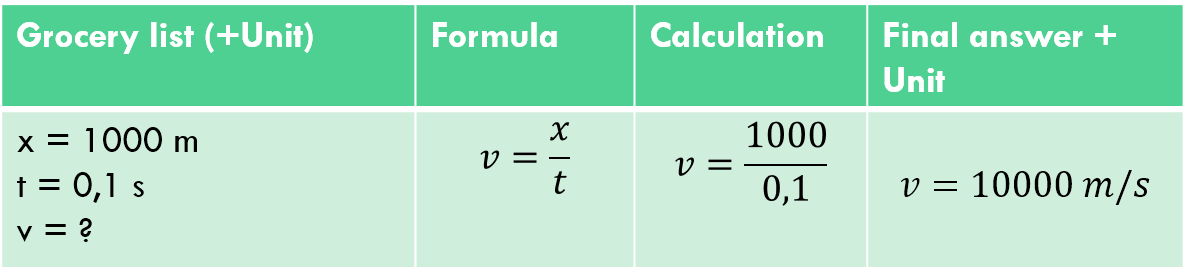
Grand Prix Car



Passenger Jet



Sound



Space Shuttle

5. When acceleration is a positive number it tells you that the object has an increase in speed so velocity increases.

When acceleration is a negative number it tells you that the object is slowing down. So deceleration or retardation.

6.

|  |  |  |  |
| --- | --- | --- | --- |
| Grocery list | Formula | Calculation | Answer |
| a = ?  Δv = 20 m/s  Δt = 8 s |  |  | a = 2,5 m/s2 |

7.

|  |  |  |  |
| --- | --- | --- | --- |
| Grocery list | Formula | Calculation | Answer |
| a = ?  Δv = -20 m/s  Δt = 5 s |  |  | a = -4 m/s2 |

8. a

|  |  |  |  |
| --- | --- | --- | --- |
| Grocery list | Formula | Calculation | Answer |
| a = 3 m/s2  Δv =  Δt = 4 s |  |  |  |

b

|  |  |  |  |
| --- | --- | --- | --- |
| Grocery list | Formula | Calculation | Answer |
| a = 3 m/s2  Δv =  Δt = 8 s |  |  |  |

Because the begin velocity was already 20 m/s you have to add the difference in velocity to the begin velocity. So final velocity is 44 m/s.

9.

|  |  |  |  |
| --- | --- | --- | --- |
| Grocery list | Formula | Calculation | Answer |
| a = -2 m/s2  Δv =  Δt = 4 s |  |  |  |

Begin velocity is 25 m/s. You have to add the difference in velocity to begin velocity so final velocity is 17 m/s.

Paragraph 2.02

Question 1

1. Between point D and E there is a time gap of 5 minutes and in those minutes you see on the y-axis that the distance not increases or decreases so the motor cycle is standing still.
2. Between A and B there is an acceleration a positive number so an increase of speed.

Between C and D there is also an acceleration but in this case it is a negative number so the motor cycle is slowing down.

1. Between points B and C because there is a straight line.
2. To calculate speed / velocity from an x,t-graph you have to take the part that is a straight line, because a straight line indicates steady speed. So we need to calculate the velocity between the points B and C.

|  |  |  |  |
| --- | --- | --- | --- |
| Grocery list | Formula | Calculation | Answer |
| v = ?  x = 40 m  t = 10 s |  |  | v = 4,0 m/s |

1. Distance travelled is the y-axis. You see on the y-axis that the total distance travelled is is 60m. After 60m the motor cycle stopped.
2. Total distance travelled is 60m and it took 25s.

|  |  |  |  |
| --- | --- | --- | --- |
| Grocery list | Formula | Calculation | Answer |
| v = ?  x = 60 m  t = 25 s |  |  | v = 2,4 m/s |

Question 2

1. Speed is the y-axis. The maximum m/s reached by the motor cycle is 30 m/s. Just read it from the y-axis.
2. In a v,t-graph acceleration can be calculated by de following equation .

|  |  |  |  |
| --- | --- | --- | --- |
| Grocery list | Formula | Calculation | Answer |
| a = ?  Δv = 30 m/s  Δt = 10 s |  |  | a = 3,0 m/s2 |

1. ALERT!!! Deceleration so the answer, a is a negative number.

|  |  |  |  |
| --- | --- | --- | --- |
| Grocery list | Formula | Calculation | Answer |
| a = ?  Δv = -30 m/s  Δt = 5 s |  |  | a = -6,0 m/s2 |

1. To know the distance from a v,t-graph you have to take the area underneath the line. The area underneath the 10 seconds has the shape of a triangle. The area of a triangle is calculated like this: . Because we don,t have a mathematical problem but physical we have to rewrite it into:
2. Total distance is the area underneath the complete line which can be divided in 3 parts. Part 1 is the rectangle during the 1st 10 seconds (this is the answer of question d) Part 2 is the rectangle between 10 and 20 seconds. Part 3 is again a rectangle between 20 and 25 seconds.

Part 1: 0-10s

Part 2: 10-20s

Part 1: 20-25s

Xtotal= 150m + 300m + 75m

1. Total time is reading the x-axis. Total time is 25 seconds
2. To calculate v, you’ll need x and t. x was calculated in question e and time in question f.

|  |  |  |  |
| --- | --- | --- | --- |
| Grocery list | Formula | Calculation | Answer |
| v = ?  x = 525 m  t = 25 s |  |  | v = 21 m/s |

Paragraph 2.04

Question 1

When you drop something you play along gravity, so g=10 m/s2. Your begin v = 0 m/s.

|  |  |  |  |
| --- | --- | --- | --- |
| Grocery list | Formula | Calculation | Answer |
| v = ?  g = 10 m/s2  t = 1 s |  |  |  |

a.

|  |  |  |  |
| --- | --- | --- | --- |
| Grocery list | Formula | Calculation | Answer |
| v = ?  g = 10 m/s2  t = 2 s |  |  |  |

b.

|  |  |  |  |
| --- | --- | --- | --- |
| Grocery list | Formula | Calculation | Answer |
| v = ?  g = 10 m/s2  t = 5 s |  |  |  |

c.

Question 2

When you drop something you play along gravity, so g=10 m/s2. Your begin v = 20 m/s. That means that all the velocity gained during the drop has to be added to the begin velocity.

|  |  |  |  |
| --- | --- | --- | --- |
| Grocery list | Formula | Calculation | Answer |
| v = ?  g = 10 m/s2  t = 1 s |  |  |  |

a.

|  |  |  |  |
| --- | --- | --- | --- |
| Grocery list | Formula | Calculation | Answer |
| v = ?  g = 10 m/s2  t = 2 s |  |  |  |

b.

|  |  |  |  |
| --- | --- | --- | --- |
| Grocery list | Formula | Calculation | Answer |
| v = ?  g = 10 m/s2  t = 5 s |  |  | s |

c.

Question 3

When you throw something up in the air you go against gravity, so g=-10 m/s2. Your begin v = 20 m/s. Because it is an upwards movement this should be -20 m/s. That means that all the velocity lost during the drop has to be added to the begin velocity.

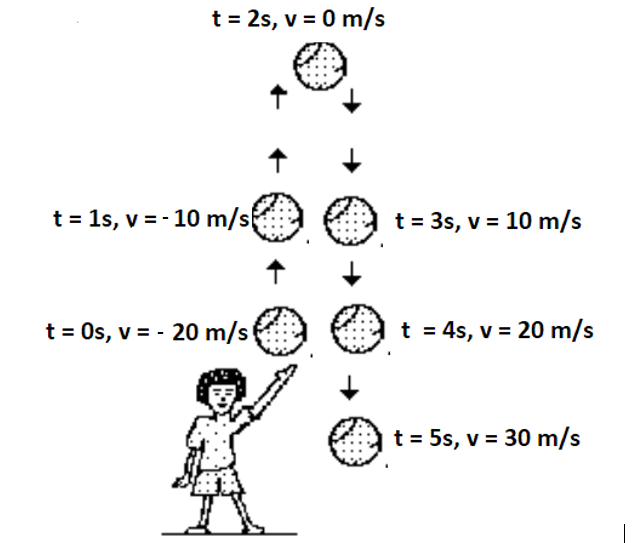
|  |  |  |  |
| --- | --- | --- | --- |
| Grocery list | Formula | Calculation | Answer |
| v = ?  g = -10 m/s2  t = 1 s |  |  |  |

a.

|  |  |  |  |
| --- | --- | --- | --- |
| Grocery list | Formula | Calculation | Answer |
| v = ?  g = -10 m/s2  t = 2 s |  |  |  |

b.

c. In question b you calculated that the stone had a velocity of 0 m/s. So after 2 seconds the stone is at its highest point and the remaining 3 seconds it will drop down again, so g becomes a positive number of 10 m/s2. Final velocity is 30 m/s.



Question 4

In question 4 you can compare the graph with the picture of the ball on the right of page 33. Point A is when the ball is released. Point B is at the highest point and point C is when the ball came down again and has the same position when it started.

1. Downwards. Velocity is a positive number. V can only be positive when g and t are also positive numbers. Remember that the formula to calculate v = g . t
2. Stationary means no movement so v = 0 m/s. This is at point B.
3. At the maximum height the ball is standing still for a fraction of a second so v = 0 m/s. this is at point B.
4. Acceleration for an up and down movement = g = a fixed number of 10 m/s2.
5. Acceleration for an up and down movement = g = a fixed number of 10 m/s2.
6. Acceleration for an up and down movement = g = a fixed number of 10 m/s2.
7. It was thrown at a speed of -30 m/s. The – only indicates that it was thrown against the force of gravity. The speed was 30 m/s and at point C it has again a speed of 30 m/s.

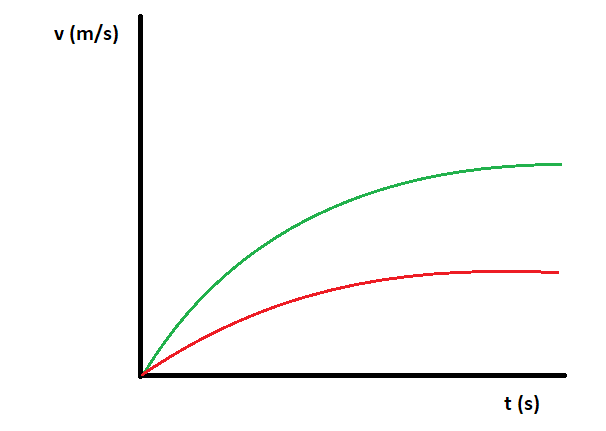
Paragraph 2.05

Question 1

1. Speed is mentioned at the y-axis so the line goes the highest on the y-axis between CD.
2. Greatest acceleration means the steepest line is AB.
3. Retardation means a decreasing line so DE.
4. Uniform means steady means a straight line is AB.
5. Non-uniform means a curved line so acceleration is BC and retardation is DE.
6. Distance traveled from a v,t-graph can be calculated by taking the area underneath the line. The greatest area is DE.

Question 2

A beach-ball has more air resistance than a stone. This means that the ball will have a lower velocity.

The green line indicates the speed for the stone and the red line indicates the line for the beach-ball.