Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Date\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Period\_\_\_\_\_\_\_\_

Speed and Velocity Problems

Write the Circle formula for Speed Here:

Distance =

Time =

Speed =

Show all work, calculations, and answers on a separate sheet of paper (use the steps given on the back of sheet).

1. If Brendan Ross throws a football 50 meters in 3 seconds, what is the average speed of the football?
2. If it takes Ashleen Quirke 3 seconds to run from the batters box to first base at an average speed of 6.5 meters per second, what is the distance she covers in that time?
3. If Homer Simpson races his Plymouth Station Wagon down Highway 37 for 2560 meters in 60 seconds, what is his average speed?
4. Bart ran 5000 meters from the principle Skinner at an average speed of 6 meters/second before he got caught. How long did he run?
5. Drake Smedt rides his motorcycle at an average speed of 20 meters/second for 500 seconds, how far did he ride?
6. Sarah backstrokes at an average speed of 8 meters per second, how long will it take her to complete the race of 200 meters length?
7. Marge’s SUV was detected exceeding the posted speed limit of 60 kilometers per hour, how many kilometers per hour would she have been traveling over the limit if she had covered the a distance of 10 kilometers in 5 minutes?
8. Jean-Luc’s calculations of his pet tarantula found that the spider was able to cover 20 centimeters in 5 seconds, what was the average speed of the spider?
9. What is the average speed of Duma if she sprints 100 m in 4 s? How about if she sprints 50 m in 2 s?
10. If Mr. Thompson’s car moves toward a fossil site with an average speed of 60 km/hr for an hour, it will travel a distance of 60 km. How far will it travel if it continues this average rate for 4 hrs?
11. Tommy Backer makes one lap around a 200 m track in a time of 25.0 s. What was his average speed? Answer:
12. A bullet is shot from a rifle with a speed of 720 m/s. What time is required for the bullet to strike a target 3240 m away?
13. The peregrine falcon is the world's fastest known bird and has been clocked diving downward toward its prey at constant vertical velocity of 97.2 m/s. If the falcon dives straight down from a height of 100. m, how much time does this give a rabbit below to consider his next move as the falcon begins his descent?
14. Ms. Kidwell stands at the rim of the Grand Canyon and yodels down to the bottom. She hears her yodel back from the canyon floor 5.20 s later. Assume that the speed of sound in air is 340.0 m/s. How deep is the Grand Canyon at that point?
15. For a long time it was the dream of many runners to break the "4-minute mile." Now quite a few runners have achieved what once seemed an impossible goal. On July 2, 1988, Steve Cram of Great Britain ran a mile in 3.81 min. During this amazing run, what was Steve Cram's average speed in:
16. mi/min?
17. mi/hr?
18. The posted speed is 65mph. Mr. Thompson leaves work at 4:30pm and arrives home at 4:50pm. If he lives 20 miles away, what is his speed on the way home? Will he receive a ticket for this speed? Is this average, instantaneous, or something else?
19. Mr. Thompson is on a ladder, perched on the ledge of a cliff, reaching for a rare perfectly preserved 30 million year old fossilized nimravid skull that is 65m above the canyon floor. As he touches the delicate artifact it suddenly breaks loose and falls to the ground below at 9.5m/s (assume constant speed and no acceleration, for now). How long does Mr. Thompson have before he begins sobbing uncontrollably when it hits and breaks into a thousand pieces? Extra credit: what is a nimravid & where did they live?
20. It’s 4th period on a Friday at C.T. English and Jack Jarnigan has forgotten to eat since dinner last night. He’s glancing at the clock regularly, waiting, stomach growling for the special all you can eat pizza deal that Cameron Korb told him about today. When the bell rings, Jack jumps, nearly colliding with three students on the way out the door on his way to the gym. He runs for 18s the total distance of 55m to the gym. What was his speed in m/s? And what is that in mph? Is he first in line? Why/why not?
21. What is the speed of a delivery truck that travels 10km in 10 minutes?
22. What distance is traveled by a sail boarder that moves at a constant speed of 1.5km/min for 5min?
23. What amount of time is needed for a rocket ship travelling 72km at 22,000km/hr?

***Steps for Word Problem***

***Equation Solving***

*Step…*

1. *Read the problem 2X or until you understand what it is asking for and what it gives you to solve it.*
2. *Single underline in the sentence what it is you need to find out (the unknown, or “X”).*
3. *Double underline in the sentence what is known (the given).*
4. *Write “X = ?” Ie. “S = ?”*
5. *Write down the two variables you do know. Ie. T = 3.5sec, D = 65m*
6. *Look at the circle formula. Write the correct formula for the unknown “X = ?” and underline it.*
7. *Next substitute in the known given variables with numbers and units.*
8. *Solve the problem for the unknown variable; do the math operation.*
9. *Cancel any units and make sure the units are in order.*
10. *Put a box around your answer.*

Additional challenge problems…

1. What is the speed of a rocket that travels 9000 meters in 12.12 seconds?
2. What is the speed of a jet plane that travels 528 meters in 4 seconds?
3. After an impact involving a non-functioning satellite, a paint chip leaves the surface   
   of the satellite at a speed of 96 m/s. After 17 seconds, how far has the chip landed?
4. The space shuttle Endeavor is launched to altitude of 500 km above the surface of   
   the earth. The shuttle travels at an average rate of 700 m/s. How long will it take for   
   Endeavor to reach its orbit?
5. How long will your trip take (in hours) if you travel 350 km at an average speed of   
   80 km/hr?
6. How many seconds will it take for a satellite to travel 450 km at a rate of 120 m/s?
7. What is the speed of a walking person in m/s if the person travels 1000 m in 20   
   minutes?
8. How far (in meters) will you travel in 3 minutes running at a rate of 6 m/s?
9. A trip to cape Canaveral, Florida takes 10 hours. The distance is 816 km.   
   Calculate the average speed.
10. In 0.5 seconds, a projectile goes from 0 to 300 m/s. What is the acceleration of the   
    projectile?
11. A meteoroid changed velocity from 1.0 km/s to 1.8 km/s in 0.03 seconds. What is  
    the acceleration of the meteoroid?
12. The space shuttle releases a space telescope into orbit around the earth. The   
    telescope goes from being stationary to traveling at a speed of 1700 m/s in 25   
    seconds. What is the acceleration of the satellite?
13. A dragster in a race accelerated from stop to 60 m/s by the time it reached the   
    finish line. The  dragster moved in a straight line and traveled from the starting line to  
    the finish line in 8.0 sec.   What was the acceleration of the dragster?



          d=9000 m  
           t=12.12 sec.  
           solving for v,  v=d/t,

**v=742.57 m/sec.**

2.  d=vt

          d=528 m  
           t=4 sec  
           solving for v, v=d/t,

**v=132 m/sec.**

    3.  d=vt

           v=96 m/sec.  
           t=17 sec.

**d=1632 m**

4.  d=vt

           d=500,000 m  
           v=700 m/sec.  
           solving for t, t=d/v,

**t=714.3 sec.(11.9 min.)**

5.   d=vt

           d=350,000 m  
           v=80,000 m/hr.  
           solving for t, t=d/v

**t=4.375 hrs.**

6.  d=vt

           d=450,000 m  
           v=120 m/sec  
           solving for t, t=d/v,

**t=3750 sec.**

     7.  d=vt

          d=1000m  
          t=20 min.(60 sec.) =1200 sec.  
                            min  
          solving for v, v=d/t,

**v=0.83 m/sec.**

8. d=vt

          v=6 m/sec  
          t=3 min.(60 sec.)=180 sec.  
                         min

**d=1080 m**

      9.  d=vt

           d=816,000 m  
           t=10 hrs.(60 min.)(60 sec.) = 36,000 sec.  
                             hrs        min  
           solving for v, v=d/t,

**v=22.67 m/sec.**               **or**

           d=816,000 m  
            t=10 hrs.  
            solving for v, v=d/t,

**v=81.6 km/hr.**

    10. a=v/t  (acceleration = velocity divided by time)

           t=0.5 sec.  
           v=300 m/sec.

**a=600 m/sec.2**

11. a=v/t

          t=0.03 sec.  
          v=0.8 km/sec.

**a=26.7 km/sec.2**

    12. a=v/t

          t=25 sec.  
          v=1700 m/sec.

**a=68 m/sec.2**

    13.  a=v/t

           t=8 sec.  
           v=60 m/sec.

**a=7.5 m/sec.2**