Conversion Problems- Solutions

1. Substitute F for C and solve:

   F = 9/5*F + 32

   F = -40°.

   Answer: E.

2. 100 feet in 2 seconds;

   $100*\frac{3,600}{2}=50*3,600$ feet in 1 hour;

   $\frac{50*3,600}{5,280}\approx 34$ miles in 1 hour.

   Answer: C.

3. We need to find the speed of the car in **miles per hour**. So, we should convert feet in miles and seconds in hours.

   20 feet is $\frac{20}{5280}$ miles;
   0.5 second is $\frac{0.5}{3600}=\frac{0.5}{60^2}$ hours;

   The speed of the car therefore is $\frac{distance}{time}=\frac{(\frac{20}{5280})}{(\frac{0.5}{60^2})}=(\frac{20}{5280})*(\frac{60^2}{0.5})$.

   Answer: A.

4. Speed of the train would be 100/2 feet per second, as it covers the distance of 100 feet in 2 seconds.

   We should transform this to miles per hour:

   100 feet=100/5280 miles;
   2 seconds=2/60^2 hours;

   Hence we would have (100/5280)/(2/60^2)=(100/5280)*(60^2/2) miles per hour.

   Answer: A.

5. Let the distance be 1 kilometer.

   Time to cover this distance at 75 kilometers per hour is 1/75 hours = 3,600/75 seconds = 48 seconds;
   Time to cover this distance at regular speed is 48+2=50 seconds = 50/3,600 hours = 1/72 hours;
   So, we get that to cover 1 kilometer 1/72 hours is needed --> regular speed 72 kilometers per hour (rate is a reciprocal of time or rate=distance/time).

   Answer: B.

6. $average = \frac{22.5\ miles}{1\ gallon} = \frac{22.5*1.6\ kilometers}{3.8\ liters} = \frac{36}{3.8} \approx 9.5$ (22.5*1.6 is ~40 and 3.8 is ~4 so the result must be ~10).

   Answer: B.

7. 1 kilometer = 6/10 mile --> 1 mile = 1/(6/10) = 10/6 kilometer;
   2 miles = 2*10/6 = 10/3 kilometers.

   Answer: A.

8. 10mm = 1cm
   100mm^2 = 1cm^2

   1mm^2 = 1/100cm^2. Answer A.

9. Number of seconds in 1 hour = 60 * 60

   $1.86*10^5 m/s = 1.86*10^5*60*60 m/h$

   $1.86*10^5*6*10*6*10$

   $1.86*10^7*36$
   $1.86*10^7*3.6*10$
   $1.86*10^8*3.6$

   E: $6,7*10^8$

10. X meters per second -->
    --> 3,600X meters per hour (as there are 3,600 seconds in one hour);
    --> 3,600X/1,000=18X/5 kilometers per hour (as there are 1,000 meters in one kilometer).

    Answer: C.

11. You can plug in values.

    C = 5/9*(F-32)

    F=32 --> C=0;
    F=32+27=59 --> C=5/9*27=15.

    Increase = 15 degrees.

    Answer: B.

12. (distance) = (time)*(rate)
    800 = (time)*125
    (time) = 800/125 = 6.4 minutes = 384 seconds.

    So, the question basically asks whether the time taken was greater than 384 seconds.

    1) It took less than 450 seconds for the child to travel from the first signpost to the second signpost. Not sufficient.

    2) It took more than 400 seconds for the child to travel from the first signpost to the second signpost. Sufficient.

    Answer: B.

13. 3.04*10^6 light years = 3.04*10^6/3.26 parsecs.

    3.04/3.26 is a little bit less than 1, something like 0.9, thus 3.04*10^6/3.26 = ~0.9*10^6 = 9*10^5.

    Answer: A.

14. Area of the carpet = xy square feet
    Cost per square foot = $50/xy square feet

    Cost per square yard = $50/(xy/9) = $450/xy square yard. Answer E.

15. Check option A: if the number of meters in AB is 100, then the number of centimeters is 100*100. The square root of 100*100 is 100: 100 = 100.

    Answer: A.