This is “mental math”. Try to do these problems in your head, *without* using a calculator or scratch paper. For an even bigger challenge, give this sheet to someone else and have them read the problems to you out loud. If you are unable to do it in your head, then go ahead and use scratch paper.

1. If a faucet drips three-hundred and four times in sixteen minutes, how many drips, on average, occurred each minute?
2. What is the sum of twelve, one-hundred twenty-four, and sixty-seven?
3. Start with the number of degrees in a right angle. Multiply this number by one-half. Finally, multiply by the number of sides on a rhombus. What is the final result?
4. If you have twelve pennies, fourteen nickels, three dimes, and six quarters in your pocket, how much money, in cents, do you have in total?
5. How many inches are in two yards?
6. What is twenty percent of six-hundred and twenty?
7. What is the average of the following numbers: five, twelve, eighteen, six, and fifty-nine?
8. What is the probability of rolling an even number followed by rolling an odd number using a fair six-sided die? Express your answer as a reduced fraction.
9. If you were to walk twelve yards north, five yards east, six yards south, then five yards west, how many yards will you be from your original position?
10. Suppose you biked one-hundred and eighty-two miles in fourteen hours. What was your average speed, in miles per hour?
11. What is the sum of the first five positive even integers?
12. What is the perimeter of a regular pentagon with a side length of thirteen?
13. Start with thirty-two. Multiply by five. Subtract thirty-two. Finally, divide by four. What is the final result?
14. If two x plus three is equal to nineteen, what does x equal?
15. What is one-fifth of the cube root of one-hundred twenty-five?

**BONUS PROBLEMS**

1. What is the diameter of a circle with an area of sixty-four pi?
2. If the newest vampire movie began at six forty-five p.m., and ended at ten p.m., how many minutes long was the movie?
3. Suppose a culture of bacteria doubles its mass every hour it is in existence. If one gram of the bacteria was created at nine a.m., what will the mass be, in grams, at two p.m.?
4. What is the greatest common factor of twenty-four and eighty-four?
5. What is the radius of a circle with a circumference of thirty-six pi?

**Solutions**

1. **19**

Hint: 16x10=160. Now double it, so 16x20=320. Now we’re close. Just remove one sixteen to get 16x19=304.

1. **203**
2. **180**
3. **262 cents**

Hint: Try to add the pennies in last. If you add up just the nickels and dimes, you end up with exactly $1.00, which makes it easier to now add in the quarters, and then finally the pennies.

1. **72 inches**
2. **124**

Hint: 10% of 620 is 62. Now double that. So 20% of 620 is 124.

1. **20**
2. **¼**
3. **6 yards**
4. **13 miles per hour**
5. **30**

Hint: It might be easier to add the first five positive integers (1,2,3,4,5) to get 15. And then realize that the first five *even* positive integers (2,4,6,8,10) are simply double, so your answer is 30.

1. **65**
2. **32**

Hint: Multiplying 32x5 and then subtracting 32 is the same as just multiplying 32x4. Once you divide this result by 4, you end up where you started … 32.

1. **8**

Hint: Subtract 3 from 19 to get 16. Then divide by 2.

1. **1**

Hint: 5x5x5 = 125, so the cube root of 125 is 5. Taking one-fifth of 5 gives you 1.

1. **16**

Hint: The area of a circle is πr2. So if the area is 64π, then r2 must be 64, which means r=8. If the radius is 8, then the diameter is twice that, or 16.

1. **195 minutes**
2. **32 grams**
3. **12**

Hint: Start with 24, and name the factors starting with the highest one: 24, 12, 8, 6, … For each one, try and see if 84 is also divisible by that factor.

1. **18**

Hint: The circumference of a circle is πd or 2πr. If the circumference is 36π, then the diameter is 36 and the radius is 18.