

## 1. (2 points)

Assume that  $a \otimes b = \frac{b!(a+b)}{b-a}$ . Evaluate  $3 \otimes b$ .

## 2. (2 points)

Vamsi desperately wants to become a KPOP star. One day, he gets a call from the manager of BTS (a KPOP band) who requests him to join, but only if he can solve the question below:

$$480 \div (4 \times 3(4 \times 8 + 10 - 2)) = ?$$

What should Vamsi's answer be?

## 3. (2 points)

Akash really wants to get a new Spider-Man toy. His mom said that she will buy him a new toy if he solves the following problem:

$$A = (3 \times 4)^2$$

$$B = 3 + 8 \times 2 - 1$$

$$C = 8 \times 4 - 2 + 19 - 2(4 \times 6)$$

What is  $A - B \times C$ ?

## 4. (2 points)

SpongeBob SquarePants is the true savior of mankind. In order to thank him we must build a statue in his honor. To build the statue we must first obtain square sponges from sponge farms. In one trip we can obtain 5 sponges, but for every 4 sponges obtained, 1 sponge accidentally gets shredded. Assuming the statue is a 20ft x 20ft square and each sponge covers 4 sq ft, how many trips must be made?

## 5. (3 points)

Varun wears tinted glasses to be like Robert Downey Jr. One day a spirit from the heavens descends upon him and tells him that he can discover Robert Downey Jr's secret if he performs the tasks listed below and multiplies them together to solve for the Downey Formula.

$A$  = the area of a rectangle with sides of 44 and 15

$B$  = the hypotenuse of a triangle with two legs of 5 and 12

$C$  = 40% of 90

Calculate the value of the Downey Formula.

## 6. (3 points)

Aniketh became jealous of Vamsi because he became a member of BTS. Out of this jealousy, Aniketh goes on a rampage. As he always hated math, he starts to break math textbooks with his bare hands. Suppose he can break a fourth of a book in 5 seconds, how many books can he break in 78 minutes?

## 7. (3 points)

Vishnav wants a giant unicorn. In order to tame the unicorn Vishnav needs to find the volume of its horn. If the horn is a right circular cone and has a height is 20 inches and its diameter is 2 feet, using 3.14 for pi, what is the volume of the horn in square inches?

## 8. (3 points)

Varun and Vamsi cant agree on the best superhero from the Marvel Universe. Varun thinks it is Samuel L. Jackson, and Vamsi thinks that it is Spider-Man. In order to settle their dispute, they agreed that whoever can solve the for the sum of the values listed below, using the set  $\{3, 1, 7, 3, 3, 6, 9, 7, 0, 2\}$ , is right.

$A$  = the mean of the set

$B$  = the median + range of the set

$C$  = the mode - range of the set

Find  $A + B + C$ .

## 9. (4 points)

While watching the World Cup, Luke develops a strange obsession for Geico commercials and quickly decides he must be in one before he leaves on his spaceship to Mars. It turns out though, that starring in a Geico commercial is very hard work indeed! To make sure he was up for the job the employers decided to test Luke by giving him the problem below:

”Find the 9th term of the following sequence:  $-1, 1, 5, 13, 29, \dots$ ”

What should Luke’s answer be?

## 10. (4 points)

Tanusri loves whole wheat bread so when she goes to the carnival with her friends, she wants to enter the bread eating contest. To calculate how many loaves of bread she can eat in one hour, solve the following problem:

$A$  = the area of a right triangle in which the 3 sides are 6, 8, and 10

$B$  = the volume of a rectangular prism that has sides that are 5, 12, and 4 inches long

$C$  = the sum of the area and circumference of a circle that has a diameter of 6

(use 3.14 for pi and round the sum to the nearest whole number)

What is  $A \times C - B$

## 11. (4 points)

Sina is going to the Olympics for backwards walking to show off his talent. At the event, Rohan, who was prepared, tied his shoelaces together before the race! Because tying shoes is very hard for Sina, it took him 2 hours to tie them, which meant Rohan had a two hour head start! Suppose Rohan was running backwards at 70 miles per hour, how many miles per hour does Sina need to run to catch up to Rohan in 4 hours?

## 12. (4 points)

What is the sum of all prime numbers between 1 and 95?

## 13. (5 points)

Hitesh dreams of growing a beard like Gandalf the Grey one day. Gandalf, being the odd person he is, has a beard in the shape of a perfect 16in16in square (Assume Gandalfs beard is two-dimensional). If Hitesh begins to grow his beard on July 4th at 12:00 AM (because hes patriotic that way) and his beard grows at a constant rate of 8 in<sup>2</sup> per day. Assuming Hitesh does not trim his beard during this time, on what date will Hiteshs beautiful beard be complete?

## 14. (5 points)

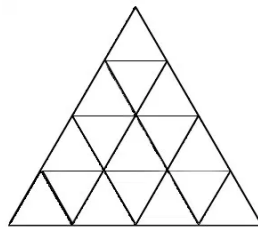
Let

$A$  = the area of a circle with a diameter of 11 feet (use 3.14 as pi)

$B$  = the probability of rolling a standard, fair six-sided die and getting an even number

$C$  = the amount of combinations you can make with 2 shirts and 2 shorts

$D$  = the number of triangles in the triangle below



Compute  $\frac{C(B - A)}{D}$  (round to the nearest whole number).

## 15. (5 points)

Jeromys head is big and it keeps getting bigger. In order to support his head the rest of his body must also grow along with it so his head does not fall off. If his head grows  $500 \text{ ft}^3$  every 2 hours, and to support this, the rest of his body must grow  $275 \text{ ft}^3$  every time this occurs. Assuming his head starts off at  $2 \text{ yd}^3$  and the rest of his body at  $3 \text{ ft}^3$  find:

$A$  = the amount of time (in hours) that has passed when the rest of his body is  $1928 \text{ ft}^3$

$B$  = the volume Jeromys body must be at to support his head at  $2054 \text{ ft}^3$