Welcome!

Do not sit in the first three rows.

Only calculators without computer algebra systems are allowed in this event.
**Question 1:**

Your weekly paycheck is 15% more than your co-worker’s. Your two paychecks total $860. Find the amount of your co-worker’s paycheck.
**Question 1:**

Your weekly paycheck is 15% more than your co-worker’s. Your two paychecks total $860. Find the amount of your co-worker’s paycheck.

**Answer:** $400
Question 2:

A bowl contains 7 red, 1 white and 2 blue marbles. Three marbles are drawn in succession, without replacement. If the first two marbles are red and white, what is the probability that the third marble is red?
**Question 2:**

A bowl contains 7 red, 1 white and 2 blue marbles. Three marbles are drawn in succession, without replacement. If the first two marbles are red and white, what is the probability that the third marble is red?

**Answer:** $\frac{6}{8}$ or $\frac{3}{4}$
Question 3:

In a paper bag there are 25 red M&M’s and 75 green M&M’s. With my eyes closed, I take two out of the bag and eat them. Then, I take another one out of the bag and place it on the table. What is the probability that it is red? (Write your answer in decimal form.)
**Question 3:**

In a paper bag there are 25 red M&M’s and 75 green M&M’s. With my eyes closed, I take two out of the bag and eat them. Then, I take another one out of the bag and place it on the table. What is the probability that it is red? (Write your answer in decimal form.)

**Answer:** 0.25
**Question 4:**

One corner of the rectangle shown is the center of the circle. What whole number do you get if you find the area of the shaded region and round up?
**Question 4:**

One corner of the rectangle shown is the center of the circle. What whole number do you get if you find the area of the shaded region and *round up*?

**Answer:** 8
**Question 5:**

Given that the sequence $a$, $b-a$, $b$, $a+b$ is an arithmetic progression for two positive numbers $a$ and $b$, find $\frac{a}{b}$.

See Answer
**Question 5:**

Given that the sequence $a, b-a, b, a+b$ is an arithmetic progression for two positive numbers $a$ and $b$, find $\frac{a}{b}$.

**Answer:** 1/3
**Question 6:**

Write

\[
\frac{5 - i}{-7 + 2i}
\]

in the form \(a + bi\), where \(a\) and \(b\) are real numbers written as fractions in lowest form.
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Write

\[
\frac{5 - i}{-7 + 2i}
\]

in the form \(a + bi\), where \(a\) and \(b\) are real numbers written as fractions in lowest form.

**Answer:**

\[
\frac{-37}{53} - \frac{3}{53}i
\]
Question 7:

Find an equation of the line containing the point $(1, -2)$ that is perpendicular to the line $x + 3y = 6$. Write your answer in $y = mx + b$ form.
**Question 7:**

Find an equation of the line containing the point \((1, -2)\) that is perpendicular to the line \(x + 3y = 6\). Write your answer in \(y = mx + b\) form.

**Answer:** \(y = 3x - 5\)
**Question 8:**

Find the surface area of a rectangular box with length 8 feet, width 4 feet, and height 7 feet.
**Question 8:**

Find the surface area of a rectangular box with length 8 feet, width 4 feet, and height 7 feet.

**Answer:** 232
Question 9:

Solve for all real numbers $x$, such that $\sqrt{2x + 11} = x$. Your answer must be exact.
Question 9:

Solve for all real numbers $x$, such that $\sqrt{2x + 11} = x$. Your answer must be exact.

Answer: $x = 1 + 2\sqrt{3}$. 
Question 10:

A mother and father have six sons and each son has one sister. How many people are there in this family in total?
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A mother and father have six sons and each son has one sister. How many people are there in this family in total?

Answer: 9

See Next Question