Congress passed a vital NASA authorization bill late Wednesday, paving the way for an extra space shuttle flight next year and a new human spaceflight plan that takes aim at missions to an asteroid -- and ultimately even to Mars. The House officially voted in favor of the bill at about 11:37 p.m. EDT (0337 GMT). The 318-106 decision came just before Congress heads into recess until after the Nov. 2 elections.

What is the probability of randomly selecting 12 congressmen and finding exactly 8 who voted for the bill?

$$f(x = 8 \mid n = 12, p = .75) = \text{.1936}$$

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What is the probability of randomly selecting 12 congressmen and finding 6 or fewer who voted for the bill?

$$f(x \leq 6 \mid n = 12, p = .75) = \textbf{.0544}$$

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What is the probability of randomly selecting 12 congressmen and finding 7, 8, or 9 who voted for the bill?

$$f(7 \le x \le 9 \mid n = 12,\ p = .75) = .5549$$

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What is the probability of randomly selecting 12 congressmen and finding at least 3 who voted against the bill?

$$f(x \geq 3 \mid n = 12,\ p = .25) =$$

$$1 - f(x \leq 2 \mid n = 12,\ p = .25) =$$

$$1 - (.0317 + .1267 + .2323) = \quad .6093$$

The newspaper incorrectly listed votes at the House of Representatives. The correct vote shows 304 in favor and 118 apposed to the NASA authorization bill to include a $19 billion budget in 2011 for the U.S. space agency. (calculate p to 4 decimals)

What is the probability of randomly selecting 12 congressmen and finding exactly 8 who voted for the bill?

$$f(x=8 \mid n=12, p=.7204) =$$

$$_nC_x p^x (1-p)^{(n-x)} =$$

$$_{12}C_8 .7204^8 (1-.7204)^{(12-8)} =$$

$$495 \times .072542 \times .00611 = \quad .21945$$

On a "Lost Continent" that once covered much of the land now occupied by the U.S., paleontologists have discovered fossils of two new dinosaur species, relatives of the famed Triceratops. The new *Kosmoceratops* has five times as many horns on its head as its cousin, making it the most ornately adorned dinosaur known to man.

The newly opened “Lost Continent” fossil museum in Kearney Nebraska (formerly the Archway Museum) receives on average 800 visitors during its 9am to 7pm operating hours.

What is the probability of exactly 19 visitors arriving in 15 minutes?

$$f(x = 19 \text{ visitors in 15 min} \mid \mu = 20 \text{ visitors per 15 min}) = .0888$$

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What is the probability of five or fewer visitors arriving in 3 minutes?

$$f(x \leq 5 \text{ visitors in 3 min} \mid \mu = 4 \text{ visitors per 3 min}) = .7851$$

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What is the probability of six or more visitors arriving in 3 minutes?

$$f(x \geq 6 \text{ visitors in 3 min} \mid \mu = 4 \text{ visitors per 3 min}) =$$

$$1 - f(x \leq 5 \text{ visitors in 3 min} \mid \mu = 4 \text{ visitors per 3 min}) = 1 - .7851 = .2149$$

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What is the probability of 12 visitors arriving in 10 minutes? (carry μ to 1 decimal)

$$f(x = 12 \text{ visitors in 10 min} \mid \mu = 13.3 \text{ visitors per 10 min}) =$$

$$\frac{e^{-\mu}\mu^{x}}{x!} = \frac{e^{-13.3}13.3^{12}}{12!} = .1070942$$