

1.(1 pt) Assume that women's weights are normally distributed with a mean given by $\mu = 143$ lb and a standard deviation given by $\sigma = 29$ lb.

(a) If 1 woman is randomly selected, find the probability that her weight is below 108

(b) If 5 women are randomly selected, find the probability that they have a mean weight below 108

(c) If 97 women are randomly selected, find the probability that they have a mean weight below 108

WARNINGS:

* This option —8— is not recognized in this subroutine
 HASH(0x8c1e7c0) TABLE border = "2" cellpadding = "3" BGCOLOR = "#FFFFFF" tr TD 8-
 /TDTD = gt; /tdtd nbsp; /td /tr /table at (eval 128) line 3674.

##More details:

— main::set_default_options called at (eval 134) line 447
 — main::romberg called at (eval 137) line 64
 — main::normal_prob called at (eval 53) line 31
 — main::_ANON_ called at /usr/lib/perl5/5.8.0/i386-linux-thread-multi/Safe.pm line 223
 — Safe::reval called at /var/www/webwork/system/lib//PGtranslator.pm line 714
 — PGtranslator::translate called at /var/www/cgi-bin/webwork/system/cgi-scripts-
 /welcomeAction.pl line 590
 — main::createTexSource called at /var/www/cgi-bin/webwork/system/cgi-scripts-
 /welcomeAction.pl line 353
 — main::downloadAllSets called at /var/www/cgi-bin/webwork/system/cgi-scripts-
 /welcomeAction.pl line 160

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 HASH(0x8c1e7c0) TABLE border = "2" cellpadding = "3" BGCOLOR = "#FFFFFF" tr TD 8-
 /TDTD = gt; /tdtd nbsp; /td /tr /table at (eval 128) line 3674.

##More details:

— main::set_default_options called at (eval 134) line 447
 — main::romberg called at (eval 137) line 64
 — main::normal_prob called at (eval 53) line 32
 — main::_ANON_ called at /usr/lib/perl5/5.8.0/i386-linux-thread-multi/Safe.pm line 223
 — Safe::reval called at /var/www/webwork/system/lib//PGtranslator.pm line 714
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 — main::downloadAllSets called at /var/www/cgi-bin/webwork/system/cgi-scripts-
 /welcomeAction.pl line 160

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##More details:

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 — main::romberg called at (eval 137) line 64
 — main::normal_prob called at (eval 53) line 33
 — main::_ANON_ called at /usr/lib/perl5/5.8.0/i386-linux-thread-multi/Safe.pm line 223
 — Safe::reval called at /var/www/webwork/system/lib//PGtranslator.pm line 714
 — PGtranslator::translate called at /var/www/cgi-bin/webwork/system/cgi-scripts-
 /welcomeAction.pl line 590
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 /welcomeAction.pl line 353
 — main::downloadAllSets called at /var/www/cgi-bin/webwork/system/cgi-scripts-
 /welcomeAction.pl line 160

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##More details:

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 — main::romberg called at (eval 137) line 64
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 — PGtranslator::translate called at /var/www/cgi-bin/webwork/system/cgi-scripts-
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 — main::romberg called at (eval 137) line 64
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 — Safe::reval called at /var/www/webwork/system/lib//PGtranslator.pm line 714
 — PGtranslator::translate called at /var/www/cgi-bin/webwork/system/cgi-scripts-
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##More details:

— main::set_default_options called at (eval 134) line 447
 — main::romberg called at (eval 137) line 64
 — main::normal_prob called at (eval 53) line 39
 — main::_ANON_ called at /usr/lib/perl5/5.8.0/i386-linux-thread-multi/Safe.pm line 223
 — Safe::reval called at /var/www/webwork/system/lib//PGtranslator.pm line 714
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##More details:

— main::set_default_options called at (eval 134) line 447
 — main::romberg called at (eval 137) line 64
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 — main::_ANON_ called at /usr/lib/perl5/5.8.0/i386-linux-thread-multi/Safe.pm line 223
 — Safe::reval called at /var/www/webwork/system/lib//PGtranslator.pm line 714
 — PGtranslator::translate called at /var/www/cgi-bin/webwork/system/cgi-scripts-
 /welcomeAction.pl line 590
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 /welcomeAction.pl line 353
 — main::downloadAllSets called at /var/www/cgi-bin/webwork/system/cgi-scripts-
 /welcomeAction.pl line 160

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##More details:

— main::set_default_options called at (eval 134) line 447
 — main::romberg called at (eval 137) line 64
 — main::normal_prob called at (eval 53) line 44
 — main::_ANON_ called at /usr/lib/perl5/5.8.0/i386-linux-thread-multi/Safe.pm line 223
 — Safe::reval called at /var/www/webwork/system/lib//PGtranslator.pm line 714
 — PGtranslator::translate called at /var/www/cgi-bin/webwork/system/cgi-scripts-
 /welcomeAction.pl line 590
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 — main::downloadAllSets called at /var/www/cgi-bin/webwork/system/cgi-scripts-
 /welcomeAction.pl line 160

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##More details:

— main::set_default_options called at (eval 134) line 447
 — main::romberg called at (eval 137) line 64
 — main::normal_prob called at (eval 53) line 45
 — main::_ANON_ called at /usr/lib/perl5/5.8.0/i386-linux-thread-multi/Safe.pm line 223
 — Safe::reval called at /var/www/webwork/system/lib//PGtranslator.pm line 714
 — PGtranslator::translate called at /var/www/cgi-bin/webwork/system/cgi-scripts-
 /welcomeAction.pl line 590
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 /welcomeAction.pl line 160

2.(1 pt) Cans of regular Coke are labeled as containing 12 oz. Statistics students weighted the content of 10 randomly chosen cans, and found the mean weight to be 12.15.

Assume that cans of Coke are filled so that the actual amounts are normally distributed with a mean of 12.00 oz and a standard deviation of 0.11 oz. Find the probability that a sample of 10 cans will have a mean amount of at least 12.15 oz.

WARNINGS:

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* This option —8— is not recognized in this subroutine
HASH(0x8c1d05c) TABLE border = "2" cellpadding = "3" BGCOLOR = "#FFFFFF" tr TD 8-
/TDTD = gt; /td td nbsp; /td /tr /table at (eval 128) line 3674.
##More details:
— main::set_default_options called at (eval 134) line 447
— main::romberg called at (eval 137) line 64
— main::normal_prob called at (eval 53) line 25
— main::_ANON_ called at /usr/lib/perl5/5.8.0/i386-linux-thread-multi/Safe.pm line 223
— Safe::reval called at /var/www/webwork/system/lib/PGtranslator.pm line 714
— PGtranslator::translate called at /var/www/cgi-bin/webwork/system/cgi-scripts-
/welcomeAction.pl line 590
— main::createTexSource called at /var/www/cgi-bin/webwork/system/cgi-scripts-
/welcomeAction.pl line 353
— main::downloadAllSets called at /var/www/cgi-bin/webwork/system/cgi-scripts-
/welcomeAction.pl line 160
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3.(1 pt) Scores for men on the verbal portion of the SAT-I test are normally distributed with a mean of 509 and a standard deviation of 112.

(a) If 1 man is randomly selected, find the probability that his score is at least 577.5.

(b) If 19 men are randomly selected, find the probability that their mean score is at least 577.5.

19 randomly selected men were given a review course before taking the SAT test. If their mean score is 577.5, is there a strong evidence to support the claim that the course is actually effective?

(Enter YES or NO)

WARNINGS:

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* This option —8— is not recognized in this subroutine
HASH(0x8c208e0) TABLE border = "2" cellpadding = "3" BGCOLOR = "#FFFFFF" tr TD 8-
/TDTD = gt; /td td nbsp; /td /tr /table at (eval 128) line 3674.
##More details:
— main::set_default_options called at (eval 134) line 447
— main::romberg called at (eval 137) line 64
— main::normal_prob called at (eval 53) line 26
— main::_ANON_ called at /usr/lib/perl5/5.8.0/i386-linux-thread-multi/Safe.pm line 223
— Safe::reval called at /var/www/webwork/system/lib/PGtranslator.pm line 714
— PGtranslator::translate called at /var/www/cgi-bin/webwork/system/cgi-scripts-
/welcomeAction.pl line 590
— main::createTexSource called at /var/www/cgi-bin/webwork/system/cgi-scripts-
/welcomeAction.pl line 353
— main::downloadAllSets called at /var/www/cgi-bin/webwork/system/cgi-scripts-
/welcomeAction.pl line 160
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* This option —8— is not recognized in this subroutine
HASH(0x8c208e0) TABLE border = "2" cellpadding = "3" BGCOLOR = "#FFFFFF" tr TD 8-
/TDTD = gt; /td td nbsp; /td /tr /table at (eval 128) line 3674.
##More details:
— main::set_default_options called at (eval 134) line 447
— main::romberg called at (eval 137) line 64
— main::normal_prob called at (eval 53) line 27
— main::_ANON_ called at /usr/lib/perl5/5.8.0/i386-linux-thread-multi/Safe.pm line 223
— Safe::reval called at /var/www/webwork/system/lib/PGtranslator.pm line 714
— PGtranslator::translate called at /var/www/cgi-bin/webwork/system/cgi-scripts-
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— main::createTexSource called at /var/www/cgi-bin/webwork/system/cgi-scripts-
/welcomeAction.pl line 353
— main::downloadAllSets called at /var/www/cgi-bin/webwork/system/cgi-scripts-
/welcomeAction.pl line 160
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4.(1 pt)

The Central Limit Theorem says

- A. When $n < 30$, the sampling distribution of \bar{x} will be approximately a normal distribution.

- B. When $n < 30$, the original population will be approximately a normal distribution.
- C. When $n > 30$, the original population will be approximately a normal distribution.
- D. When $n > 30$, the sampling distribution of \bar{x} will be approximately a normal distribution.
- E. None of the above

5.(1 pt) A soft drink bottler purchases glass bottles from a vendor. The bottles are required to have an internal pressure of at least 150 pounds per square inch (psi). A prospective bottle vendor claims that its production process yields bottles with a mean internal pressure of 157 psi and a standard deviation of 3 psi. The bottler strikes an agreement with the vendor that permits the bottler to sample from the production process to verify the claim. the bottler randomly selects 40 bottles from the last 10000 produced, measures the internal pressure of each, and finds the mean pressure for the sample to be 0.9 psi below the process mean cited by the vendor.

(a) Assuming that the vendor is correct in his claim, what is the probability of obtaining a sample mean this far or farther below the process mean?

(b) If the standard deviation were 3 psi as claimed, but the mean was 152 psi, what is the probability of obtaining a sample mean of 156.1 psi or below?

(c) If the process mean were 157 psi as claimed, but the standard deviation was 2.4 psi, what is the probability of obtaining a sample mean of 156.1 psi or below?

WARNINGS:

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* This option —8— is not recognized in this subroutine
HASH(0x8c255dc) TABLE border = "2" cellpadding = "3" BGCOLOR = "#FFFFFF" tr TD 8-
/TDTD = gt; /td td nbsp; /td /tr /table at (eval 128) line 3674.
##More details:
— main::set_default_options called at (eval 134) line 447
— main::romberg called at (eval 137) line 64
— main::normal_prob called at (eval 53) line 31
— main::_ANON_ called at /usr/lib/perl5/5.8.0/i386-linux-thread-multi/Safe.pm line 223
— Safe::reval called at /var/www/webwork/system/lib/PGtranslator.pm line 714
— PGtranslator::translate called at /var/www/cgi-bin/webwork/system/cgi-scripts-
/welcomeAction.pl line 590
— main::createTexSource called at /var/www/cgi-bin/webwork/system/cgi-scripts-
/welcomeAction.pl line 353
— main::downloadAllSets called at /var/www/cgi-bin/webwork/system/cgi-scripts-
/welcomeAction.pl line 160
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* This option —8— is not recognized in this subroutine
HASH(0x8c255dc) TABLE border = "2" cellpadding = "3" BGCOLOR = "#FFFFFF" tr TD 8-
/TDTD = gt; /td td nbsp; /td /tr /table at (eval 128) line 3674.
##More details:
— main::set_default_options called at (eval 134) line 447
— main::romberg called at (eval 137) line 64
— main::normal_prob called at (eval 53) line 32
— main::_ANON_ called at /usr/lib/perl5/5.8.0/i386-linux-thread-multi/Safe.pm line 223
— Safe::reval called at /var/www/webwork/system/lib/PGtranslator.pm line 714
— PGtranslator::translate called at /var/www/cgi-bin/webwork/system/cgi-scripts-
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HASH(0x8c255dc) TABLE border = "2" cellpadding = "3" BGCOLOR = "#FFFFFF" tr TD 8-
/TDTD = gt; /td td nbsp; /td /tr /table at (eval 128) line 3674.
##More details:
— main::set_default_options called at (eval 134) line 447
— main::romberg called at (eval 137) line 64
— main::normal_prob called at (eval 53) line 33
— main::_ANON_ called at /usr/lib/perl5/5.8.0/i386-linux-thread-multi/Safe.pm line 223
— Safe::reval called at /var/www/webwork/system/lib/PGtranslator.pm line 714
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— PGtranslator::translate called at /var/www/cgi-bin/webwork/system/cgi-scripts-  
/welcomeAction.pl line 590  
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/welcomeAction.pl line 160
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6.(1 pt) Suppose that from the past experience a professor knows that the test score of a student taking his final examination is a random variable with mean 65 and standard deviation 10. How many students would have to take the examination to ensure, with probability at least 0.94, that the class average would be within 2 of 65?

7.(1 pt) 90 numbers are rounded off to the nearest integer and then summed. If the individual round-off error are uniformly distributed over $(-.5, .5)$ what is the probability that the resultant sum differs from the exact sum by more than 2?

WARNINGS:

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* This option —8— is not recognized in this subroutine  
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— main::normal_prob called at (eval 53) line 25  
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— PGtranslator::translate called at /var/www/cgi-bin/webwork/system/cgi-scripts-  
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— main::createTexSource called at /var/www/cgi-bin/webwork/system/cgi-scripts-  
/welcomeAction.pl line 353  
— main::downloadAllSets called at /var/www/cgi-bin/webwork/system/cgi-scripts-  
/welcomeAction.pl line 160
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8.(1 pt) A die is continuously rolled until the total sum of all rolls exceeds 350. What is the probability that at least 105 rolls are necessary?
