NEW YORK STATE
COMPONENT RETEST

MATHEMATICS A
COMPONENT 6
MODULE 2

THURSDAY, MAY 15, 2003

SCORING KEY
AND
RATING GUIDE

Multiple Choice Key

1	4
2	4
3	2
4	1
5	3
6	2

Math A Component Retest
May 2003
Component 6, Module 2

Key to Multiple-Choice Questions

(1)	4
(2)	4
(3)	2
(4)	1
(5)	3
(6)	2

Rubric

(7)

[4] $P(\text{R}) = \frac{10}{20}$, $P(\text{W}) = \frac{5}{20}$, and $P(\text{B}) = \frac{5}{20}$, or equivalent expressions, and appropriate work is shown, such as $W + 2W + 2W - 5 = 20$ or trial and error with at least three trials and appropriate checks.

[3] Only one probability is calculated incorrectly, but appropriate work is shown.

or

[3] Appropriate work is shown, but one computational error is made, but appropriate probabilities are calculated.

[2] A correct expression is written to represent each color marble, but an incorrect equation is written, but an appropriate solution is found.

or

[2] Appropriate work is shown, but more than one computational error is made, but appropriate probabilities are calculated.

or

[2] A correct equation is written and solved correctly for the number of all three color marbles, but no probabilities are calculated.

or

[2] The trial-and-error method is used to find a correct solution, but only two trials and appropriate checks are shown.

[1] A correct equation is written and solved correctly, but the number of only one color marble is found, and no probabilities are calculated.

or

[1] A correct expression is written to represent one or two color marbles, but appropriate probabilities are calculated.

or

[1] Appropriate work is shown, but more than one computational error is made, and the appropriate number of marbles is found, but no probabilities are calculated.

or

[1] $P(\text{R}) = \frac{10}{20}$, $P(\text{W}) = \frac{5}{20}$, and $P(\text{B}) = \frac{5}{20}$, or equivalent expressions, but no work or only one trial with an appropriate check is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

Part II

Answer all questions in this part. Each correct answer will receive 4 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. For all questions in this part, a correct numerical answer with no work shown will receive only 1 credit. [12]

7 A jar contains 20 marbles that are red, white, or blue. There are twice as many red marbles as white marbles. If the number of blue marbles is five less than the number of red marbles, calculate the individual probability of drawing *each* color marble.

- red - $2x = 10$
white $x = 5$
blue $= 2x - 5 = 5$

$2x + x + 2x - 5 = 20$
$+5 \quad +5$

$2x + x + 2x = 25$
$5x = 25$
$x = 5$

red $= 10/20 = 1/2$
white $= 5/20 = 1/4$
blue $= 5/20 = 1/4$

$2(5) - 5$
$10 - 5 = 5$

SCORE POINT: 4

Part II

Answer all questions in this part. Each correct answer will receive 4 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. For all questions in this part, a correct numerical answer with no work shown will receive only 1 credit. [12]

7 A jar contains 20 marbles that are red, white, or blue. There are twice as many red marbles as white marbles. If the number of blue marbles is five less than the number of red marbles, calculate the individual probability of drawing *each* color marble.

$2x$ = red

x = white

$2x-5$ = Blue : $5/20$

$5x - 5 = 20$

$+5 \quad +5$

$\frac{5x}{5} = \frac{25}{5}$

$x = 5$

White: $\frac{5}{20}$

SCORE POINT: 3

Part II

Answer all questions in this part. Each correct answer will receive 4 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. For all questions in this part, a correct numerical answer with no work shown will receive only 1 credit. [12]

7 A jar contains 20 marbles that are red, white, or blue. There are twice as many red marbles as white marbles. If the number of blue marbles is five less than the number of red marbles, calculate the individual probability of drawing *each* color marble.

20 marbles

white = $x = 5$

red = $2x = 10$

blue = $2x - 5 = 5$

$x + 2x + 2x - 5 = 20$

$5x - 5 = 20$

$+5 \quad +5$

$\frac{5x}{5} = \frac{25}{5}$

$x = 5$

SCORE POINT: 2

Part II

Answer all questions in this part. Each correct answer will receive 4 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. For all questions in this part, a correct numerical answer with no work shown will receive only 1 credit. [12]

7 A jar contains 20 marbles that are red, white, or blue. There are twice as many red marbles as white marbles. If the number of blue marbles is five less than the number of red marbles, calculate the individual probability of drawing *each* color marble.

$2x + 2x - 5 + x = 20$

$5x = 25$

$x = 5$

$20P_{10}$ $\quad$ $20C_5$

2 2 2 5 2

20 19 18 17 16 15 14 13 12 11 $\quad$ 25965840

10 9 8 7 6 5 4 3 2 1

SCORE POINT: 1

Part II

Answer all questions in this part. Each correct answer will receive 4 credits. Clearly indicate the necessary steps, including appropriate formula substitutions, diagrams, graphs, charts, etc. For all questions in this part, a correct numerical answer with no work shown will receive only 1 credit. [12]

7 A jar contains 20 marbles that are red, white, or blue. There are twice as many red marbles as white marbles. If the number of blue marbles is five less than the number of red marbles, calculate the individual probability of drawing *each* color marble.

$2x = 20$

x

$x = 10$

SCORE POINT: 0

Rubric

(8)

[4] .8, and appropriate work is shown, such as $\frac{8\pi}{32}$.

[3] Appropriate work is shown, but one computational or rounding error is made.

or

[3] The probability of landing in the shaded area is determined correctly.

[2] The area of the rectangle and the area of the circles are determined correctly, but no probability is found.

or

[2] Appropriate work is shown, but more than one computational or rounding error is made.

or

[2] Either the area of the circles or the area of the rectangle is determined incorrectly, but an appropriate probability is determined.

[1] Both the area of the rectangle and the area of the circles are determined incorrectly, but these values are used to find an appropriate probability.

or

[1] The area of the rectangle and the area of one circle is determined correctly, but no probability is found.

or

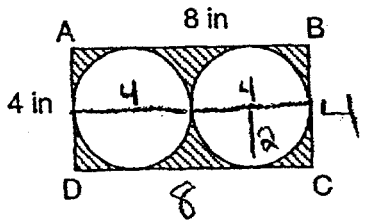
[1] The total area of both circles is found correctly, but no further correct work is shown.

or

[1] .8, but no work is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

8 The accompanying diagram shows a dart game target in which two congruent and tangent circles are inscribed in a rectangle, $ABCD$, where $AB = 8$ and $AD = 4$. If a dart thrown at the target is equally likely to land anywhere on the target, find the probability, to the *nearest tenth*, that the dart will *not* land in the shaded region.



$A = lw$ $A = 8 \times 4$ $A = 32$

$A = (\pi r^2)^2$ $A = 25.13$

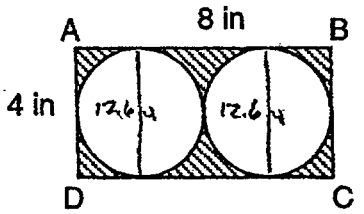
Shaded Region = 6.9

$\frac{25.13}{32}$

? will not hit on shaded region .8

SCORE POINT: 4

8 The accompanying diagram shows a dart game target in which two congruent and tangent circles are inscribed in a rectangle, $ABCD$, where $AB = 8$ and $AD = 4$. If a dart thrown at the target is equally likely to land anywhere on the target, find the probability, to the *nearest tenth*, that the dart will *not* land in the shaded region.



$A = lw$

$A = 8(4)$

$A = 32$

$A \text{ of } \odot = \pi r^2$

$= \pi(2)^2$

$= \pi 4$

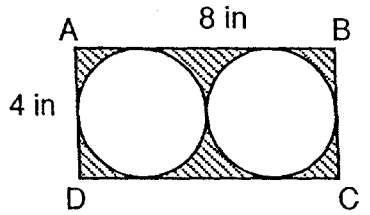
$A = 12.566$

$12.566 \cdot 2 = 25.132$

$\frac{25.132}{32} = .785$

SCORE POINT: 3

8 The accompanying diagram shows a dart game target in which two congruent and tangent circles are inscribed in a rectangle, $ABCD$, where $AB = 8$ and $AD = 4$. If a dart thrown at the target is equally likely to land anywhere on the target, find the probability, to the *nearest tenth*, that the dart will *not* land in the shaded region.



(2 circles) $P_1 = 12,56 \cdot 2 = 25,13$

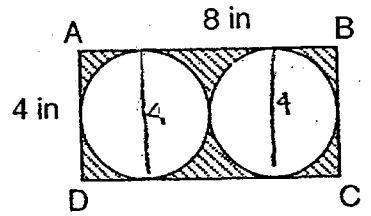
$P_1(ABCD) = 32$

the shaded region is $32 - 25,13 = 6,87$

The probability is $6,87$

SCORE POINT: 2

8 The accompanying diagram shows a dart game target in which two congruent and tangent circles are inscribed in a rectangle, $ABCD$, where $AB = 8$ and $AD = 4$. If a dart thrown at the target is equally likely to land anywhere on the target, find the probability, to the *nearest tenth*, that the dart will *not* land in the shaded region.



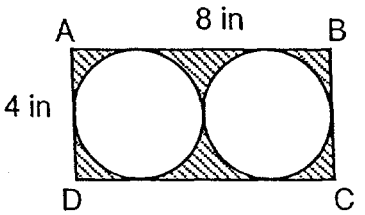
$A = bh$
$A = 8 \cdot 4$
$A = 32 in^2$

$A = \pi r^2$
$A = \pi 2^2$
$A = 4\pi$
$A = 12.566 in^2$

$32 - 12.566 in^2 =$
19.4

SCORE POINT: 1

8 The accompanying diagram shows a dart game target in which two congruent and tangent circles are inscribed in a rectangle, $ABCD$, where $AB = 8$ and $AD = 4$. If a dart thrown at the target is equally likely to land anywhere on the target, find the probability, to the *nearest tenth*, that the dart will *not* land in the shaded region.



$A = L \cdot W$

$A = 8 \cdot 4 = 32$

$A = 32$

SCORE POINT: 0

Rubric

(9)

[4] 60, and appropriate work is shown, such as ${}_5C_2 \bullet {}_3C_1 \bullet {}_2C_1$, a tree diagram, or a sample space.

[3] Appropriate work is shown, but one computational error is made.

[2] One conceptual error is made, but an appropriate answer is found.

or

[2] ${}_5C_2 \bullet {}_3C_1 \bullet {}_2C_1$ is written, but no further correct work is shown.

or

[2] Appropriate work is shown, but more than one computational error is made.

or

[2] One incorrect combination is used and one computational error is made, but an appropriate answer is found.

or

[2] The correct answer is found, but insufficient work is shown, such as $10 \bullet 3 \bullet 2 = 60$.

[1] 60, but no work is shown.

[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.

9 A group of 10 friends decided to start a band. There are 5 guitarists, 3 keyboard players, and 2 drummers. How many different bands can be formed consisting of 2 guitarists, 1 keyboard player, and 1 drummer?

$5C_2 \cdot 3C_1 \cdot 2C_1 =$ Answer

$10 \cdot 3 \cdot 2 =$ 60 combinations

60 bands

SCORE POINT: 4

9 A group of 10 friends decided to start a band. There are 5 guitarists, 3 keyboard players, and 2 drummers. How many different bands can be formed consisting of 2 guitarists, 1 keyboard player, and 1 drummer?

Total = 10
guiteur = 5
keyboard = 3
drummers = 2

$= {}_5C_2 \cdot 3C_1 \cdot 2C_1$

$10 \cdot 3 \cdot 2 = 120$

SCORE POINT: 3

9 A group of 10 friends decided to start a band. There are 5 guitarists, 3 keyboard players, and 2 drummers. How many different bands can be formed consisting of 2 guitarists, 1 keyboard player, and 1 drummer?

$_5P_2 \times {}_3P_1 \times {}_2P_1$

$20 \times 3 \times 2$

$60 \times 2 = \boxed{120 \text{ bands}}$

SCORE POINT: 2

9 A group of 10 friends decided to start a band. There are 5 guitarists, 3 keyboard players, and 2 drummers. How many different bands can be formed consisting of 2 guitarists, 1 keyboard player, and 1 drummer?

60

Sp^2

SCORE POINT: 0