

Texas Assessment of Knowledge and Skills

Grade: 06

Subject: Mathematics

Administration: Spring 2003

Note: Measurement questions may have had scale altered in duplication.

6-Objective 1: Number, operation, and quantitative reasoning. The student represents and uses rational numbers in a variety of equivalent forms. The student is expected to

(A) compare and order non-negative rational numbers;

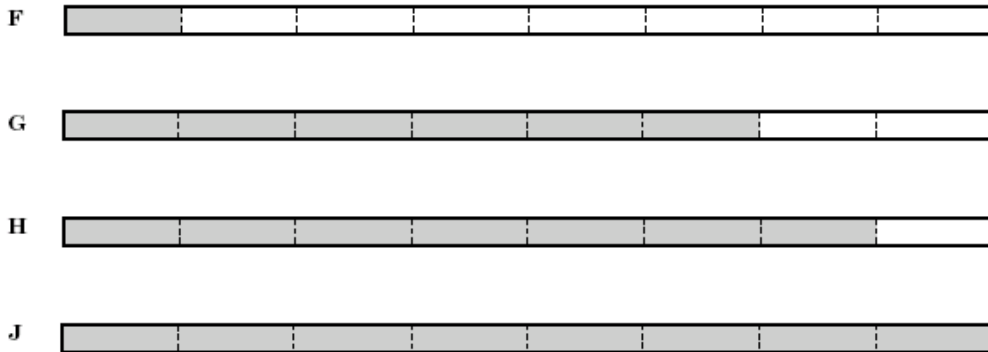
7 Sam recorded the lengths of his model cars in inches. Which list shows the lengths in order from greatest to least?

- A 6.8 in., 6.78 in., 6.45 in., 6.5 in., 6.34 in.
- B 6.34 in., 6.45 in., 6.5 in., 6.78 in., 6.8 in.
- C 6.8 in., 6.78 in., 6.45 in., 6.34 in., 6.5 in.
- D 6.8 in., 6.78 in., 6.5 in., 6.45 in., 6.34 in.

(6.2) Number, operation, and quantitative reasoning. The student adds, subtracts, multiplies, and divides to solve problems and justify solutions. The student is expected to

(A) model addition and subtraction situations involving fractions with [objects,] pictures, words, and numbers;

12 Mara plans to buy fabric for two sewing projects. One project requires $\frac{1}{8}$ yard of fabric, and the other requires $\frac{3}{4}$ yard of fabric. Each strip below represents 1 yard of fabric. Which strip is shaded to show the total amount of fabric that Mara needs for her projects?



6-Objective 1

6.1(D) write prime factorizations using exponents;

14 Find the prime factorization of 60.

F $3^2 \cdot 10$

G $2 \cdot 3 \cdot 10$

H $2 \cdot 2 \cdot 15$

J $2^2 \cdot 3 \cdot 5$

6.1(A) compare and order non-negative rational numbers;

16 Amy, Jasmine, Katrina, and Myra each walked from their houses to the mall. Amy walked $\frac{1}{2}$ mile, Jasmine walked $\frac{1}{4}$ mile, Katrina walked $\frac{3}{4}$ mile, and Myra walked $\frac{5}{8}$ mile. Which list shows these distances in order from greatest to least?

F $\frac{1}{2}$ mi, $\frac{1}{4}$ mi, $\frac{3}{4}$ mi, $\frac{5}{8}$ mi

G $\frac{3}{4}$ mi, $\frac{5}{8}$ mi, $\frac{1}{2}$ mi, $\frac{1}{4}$ mi

H $\frac{1}{4}$ mi, $\frac{1}{2}$ mi, $\frac{5}{8}$ mi, $\frac{3}{4}$ mi

J $\frac{5}{8}$ mi, $\frac{3}{4}$ mi, $\frac{1}{4}$ mi, $\frac{1}{2}$ mi

6.1(B) generate equivalent forms of rational numbers including whole numbers, fractions, and decimals;

20 Stephanie bought a basketball on sale for \$15, which was $\frac{1}{5}$ off the original price. What decimal represents the discount she received?

F 0.05

G 0.15

H 0.20

J 0.50

6-Objective 1

6.2(C) use multiplication and division of whole numbers to solve problems including situations involving equivalent ratios and rates;

32 Linda bought 2 blouses for a total of \$52 and 3 equally priced dresses. She spent a total of \$148, not including tax. Find the price of each dress.

- F** \$26
- G** \$32
- H** \$52
- J** \$55

6.1(C) use integers to represent real-life situations;

36 The low temperature on Saturday was 10 degrees below zero Celsius. On Sunday the low temperature was 30 degrees above zero Celsius. What integer represents the low temperature on Saturday in degrees Celsius?

- F** 20
- G** 10
- H** -10
- J** -20

6.1(E) identify factors and multiples including common factors and common multiples.

38 At a spring band concert, a prize was awarded to the person sitting in the chair numbered with the least common multiple of 12, 15, and 30. Find the number of the prizewinning chair.

- F** 60
- G** 45
- H** 30
- J** 15

6.2(B) use addition and subtraction to solve problems involving fractions and decimals;

42 Harold made a drawing of his rectangular kitchen for art class. The length of the drawing was 8.6 inches, and the width of the drawing was 2.5 inches less than the length. Find the width of the drawing.

- F** 6.1 in.
- G** 8.6 in.
- H** 11.1 in.
- J** 21.5 in.

6-Objective 1

6.2(D) estimate and round to approximate reasonable results and to solve problems where exact answers are not required.

44 For a science project Ruth is keeping track of the calories her father eats at breakfast. The table shows the number of calories he ate at breakfast on Monday.

Breakfast Calories

Food	Number of Servings	Number of Calories per Serving
Oat Cereal	1	80
Skim Milk	1	40
Orange Juice	1	86
Banana	1	105
Flavored Coffee	1	55

Which is closest to the number of calories Ruth's father ate at breakfast on Monday?

- F** 200 cal
- G** 300 cal
- H** 400 cal
- J** 500 cal

6-Objective 2: The student will demonstrate an understanding of patterns, relationships, and algebraic reasoning.

(6.3) Patterns, relationships, and algebraic thinking. The student solves problems involving proportional relationships. The student is expected to

(C) use ratios to make predictions in proportional situations.

10 The ratio of red rosebushes to yellow rosebushes in the school garden is about 3 to 4. If there were 36 yellow rosebushes, about how many red rosebushes would there be?

- F** 36
- G** 32
- H** 27
- J** 12

6.3(C) use ratios to make predictions in proportional situations.

15 Corinne's group was responsible for painting windows on the set of a school play. The group painted 18 windows in 90 minutes. If they continued painting at this rate, how many windows would they paint in 3 hours?

- A** 24
- B** 36
- C** 54
- D** 72

6.3(B) represent ratios and percents with [concrete] models, fractions, and decimals;

18 By 2:30 P.M. on Monday, 25% of the classes at Valley Middle School had finished taking yearbook pictures. What fractional part of the classes had NOT yet taken yearbook pictures?

- F** $\frac{1}{25}$
- G** $\frac{1}{4}$
- H** $\frac{2}{5}$
- J** $\frac{3}{4}$

6-Objective 2

6.3(A) use ratios to describe proportional situations;

24 There were 14 boats and 42 people registered for a boat race. Which ratio accurately compares the number of people to the number of boats?

- F** 2:6
- G** 3:1
- H** 7:21
- J** 14:42

(6.4) Patterns, relationships, and algebraic thinking. The student uses letters as variables in mathematical expressions to describe how one quantity changes when a related quantity changes. The student is expected to

(A) use tables and symbols to represent and describe proportional and other relationships involving conversions, sequences, perimeter, area, etc.;

28 The table shows Andre's age and Maria's age over 4 consecutive years.

Ages

Andre's Age, x (years)	Maria's Age, y (years)
4	8
5	9
6	10
7	11

Which expression best represents Maria's age in terms of Andre's age?

- F** $x + 4$
- G** $2x$
- H** $y + 4$
- J** $2y$

6-Objective 2

(6.5) Patterns, relationships, and algebraic thinking. The student uses letters to represent an unknown in an equation. The student is expected to

(A) formulate an equation from a problem situation.

29 David bought 2 shirts that were originally priced at \$26.50 each. Each shirt was on sale for \$3.98 off the original price when David bought them. Which equation can be used to find t , the total sale price of the 2 shirts?

A $t = 26.50 - 3.98$

B $t = 2(26.50) - 3.98$

C $t = 2(3.98) - 2(26.50)$

D $t = 2(26.50) - 2(3.98)$

6.3(A) use ratios to describe proportional situations;

35 If the ratio of boys to girls in the sixth-grade chorus is 2 to 3, which of these shows possible numbers of the boys and girls in the chorus?

A 20 boys, 35 girls

B 24 boys, 36 girls

C 35 boys, 20 girls

D 36 boys, 24 girls

6-Objective 2

6.4(B) generate formulas to represent relationships involving perimeter, area, volume of a rectangular prism, etc., from a table of data.

37 A certain regular polygon is made of congruent equilateral triangles. The table shows the relationship between the area of the triangle and the area of the polygon it is part of.

Triangles in Polygons

Area of Triangle (square units)	Area of Polygon (square units)
3	18
4	24
5	30
6	36
n	

Which expression can be used to find the area of a similar polygon made of triangles with an area of n square units each?

- A $1n$
- B $6n$
- C $n + 6$
- D $n + 36$

6.5(A) formulate an equation from a problem situation.

45 Mr. Chávez distributed 78 sheets of drawing paper to the art students in his class. Each student received 3 sheets of drawing paper. Which equation can be used to find s , the number of students in the class?

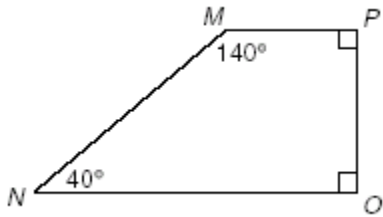
- A $s = 78 \div 3$
- B $s = 75 - 3$
- C $s = 78 \times 3$
- D $s = 78 + 3$

6-Objective 3: The student will demonstrate an understanding of geometry and spatial reasoning.

(6.6) Geometry and spatial reasoning. The student uses geometric vocabulary to describe angles, polygons, and circles. The student is expected to

(A) use angle measurements to classify angles as acute, obtuse, or right;

4 What kind of angle is $\angle N$?

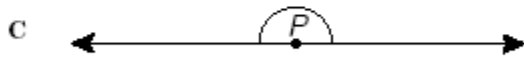
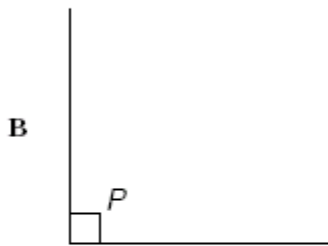


- F** Acute
- G** Right
- H** Obtuse
- J** Straight

6-Objective 3

6.6(A) use angle measurements to classify angles as acute, obtuse, or right;

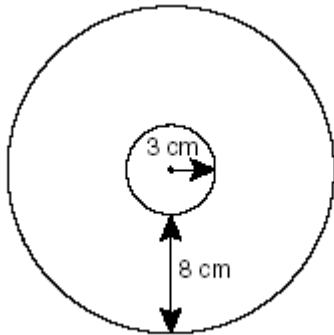
5 In which of the pictures below does $\angle P$ appear to be an obtuse angle?



6-Objective 3

6.6(C) describe the relationship between radius, diameter, and circumference of a circle.

27 The drawing shows 2 circles that share a common center point.

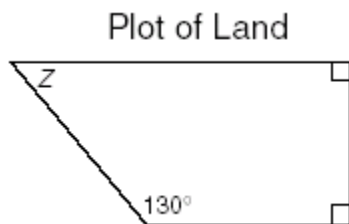


Which expression can be used to find the approximate circumference of the outer circle in centimeters?

- A $\pi(3 + 8)$
- B $\frac{1}{2}(3 + 8)$
- C $2\pi(3 + 8)$
- D $2(3 + 8)$

6.6(B) identify relationships involving angles in triangles and quadrilaterals;

30 The drawing below shows the shape of a plot of land.



Find the measure of $\angle Z$.

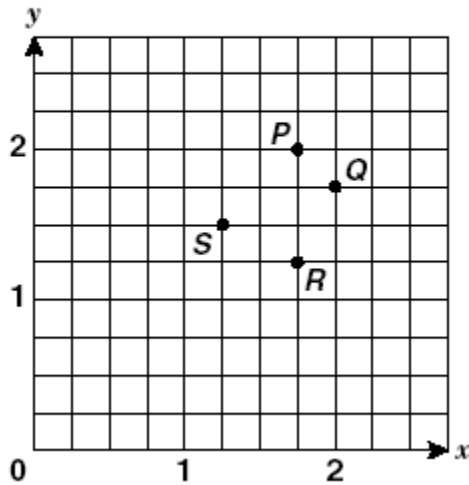
- F 40°
- G 50°
- H 90°
- J 180°

6-Objective 3

(6.7) Geometry and spatial reasoning. The student uses coordinate geometry to identify location in two dimensions. The student is expected to

(A) locate and name points on a coordinate plane using ordered pairs of non-negative rational numbers.

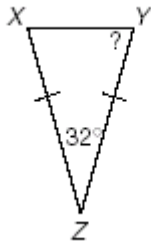
- 39 Which point best represents the location of the ordered pair $(1\frac{3}{4}, 2)$?



- A Point *P*
- B Point *Q*
- C Point *R*
- D Point *S*

6.6(B) identify relationships involving angles in triangles and quadrilaterals;

- 40 Triangle *XYZ* is an isosceles triangle. If the measure of $\angle Z$ is 32° , what is the measure of $\angle Y$?



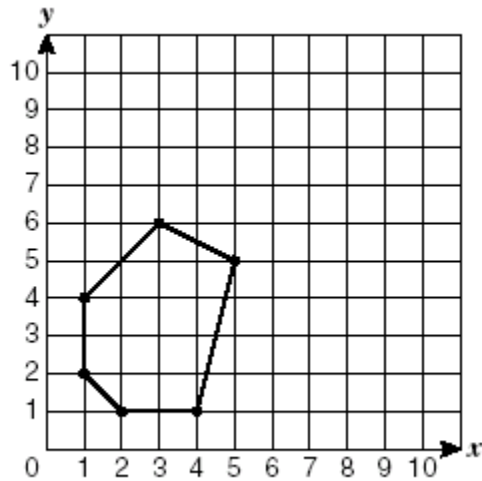
- F 32°
- G 74°
- H 148°
- J 164°

6-Objective 3

6.7(A) locate and name points on a coordinate plane using ordered pairs of non-negative rational numbers.

43 Valerie listed the coordinates of 5 of the vertices of the hexagon below.

$(1, 2)$, $(1, 4)$, $(2, 1)$, $(4, 1)$, $(5, 5)$



Which of these shows the coordinates of the vertex that Valerie did not list?

- A $(1, 3)$
- B $(3, 1)$
- C $(3, 6)$
- D $(6, 3)$

6-Objective 4: The student will demonstrate an understanding of the concepts and uses of measurement.

(6.8) Measurement. The student solves application problems involving estimation and measurement of length, area, time, temperature, capacity, weight, and angles. The student is expected to

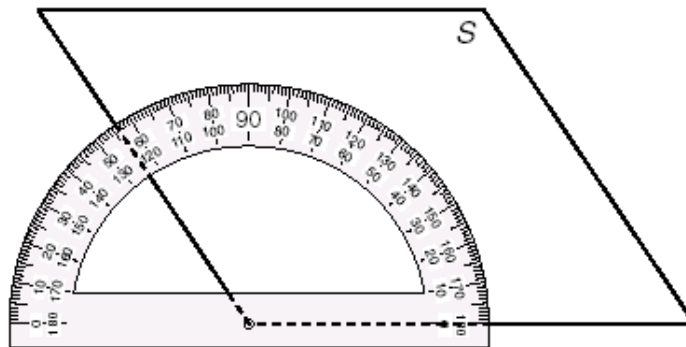
(D) convert measures within the same measurement system (customary and metric) based on relationships between units.

9 Anna's brother is 117 centimeters tall. How is 117 centimeters expressed in meters?

- A 0.117 m
- B 1.17 m
- C 11.7 m
- D 117 m

6.8(C) measure angles;

19 A parallelogram is shown below.



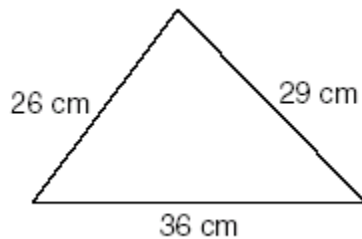
Find the measure of $\angle S$ to the nearest degree.

- A 136°
- B 124°
- C 64°
- D 56°

6-Objective 4

6.8(B) select and use appropriate units, tools, or formulas to measure and to solve problems involving length (including perimeter and circumference), area, time, temperature, capacity, and weight;

21 Lauren cut a triangle out of construction paper for a geometry project.



Find the perimeter of the triangle in centimeters.

Record your answer and fill in the bubbles on your answer document. Be sure to use the correct place value.

6.8(B) select and use appropriate units, tools, or formulas to measure and to solve problems involving length (including perimeter and circumference), area, time, temperature, capacity, and weight;

23 Francesca used a square piece of poster board to show the main points of her history presentation. The length of each side of the poster board was 24 inches. Find the area of the poster board.

- A 48 in.²
- B 96 in.²
- C 400 in.²
- D 576 in.²

6.8(A) estimate measurements and evaluate reasonableness of results;

34 On Tuesday night Lucas spent 18 minutes on social studies homework, 29 minutes on language arts homework, and 59 minutes on mathematics homework. About how much time in all did Lucas spend on his homework?

- F 1 hour 50 minutes
- G 1 hour 10 minutes
- H 1.5 hours
- J 1.10 hours

6-Objective 5: The student will demonstrate an understanding of probability and statistics.

(6.10) Probability and statistics. The student uses statistical representations to analyze data. The student is expected to

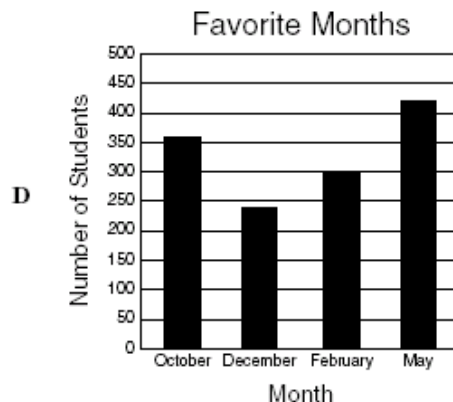
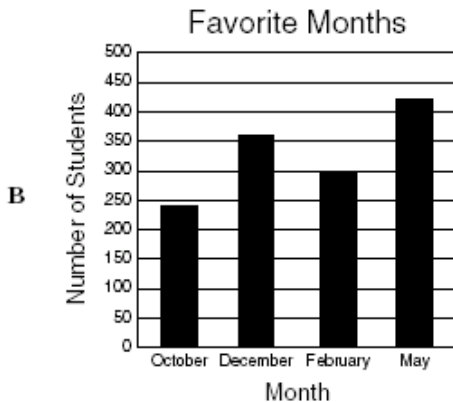
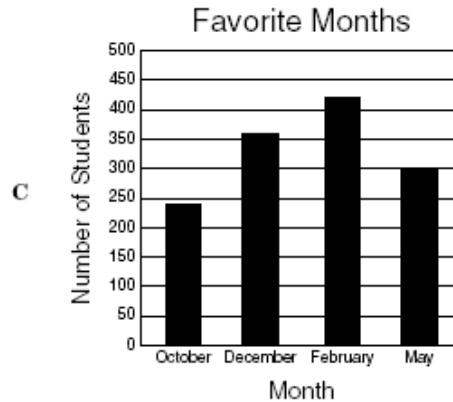
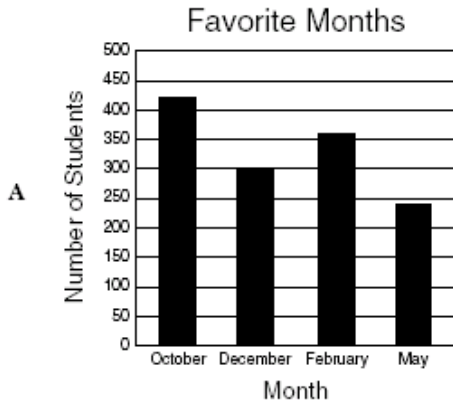
(A) [draw and] compare different graphical representations of the same data;

1 Cynthia surveyed the students at her school about their favorite month during the school year. The table below shows the results of the survey.

Favorite Months

Month	Number of Students
October	240
December	360
February	300
May	420

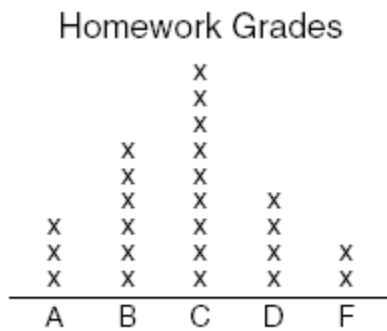
Which graph correctly displays the data in the table?



6-Objective 5

6.10(D) solve problems by collecting, organizing, displaying, and interpreting data.

6 The line plot shows the homework grades of the students in Mrs. Smith's class.



Which statement is supported by the information in the line plot?

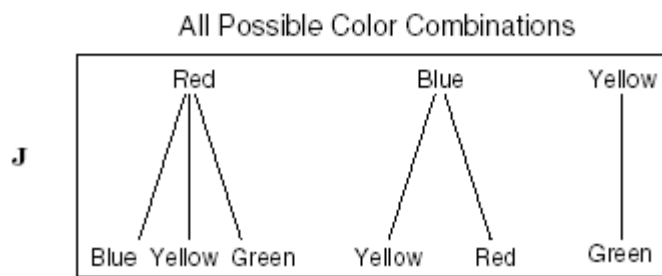
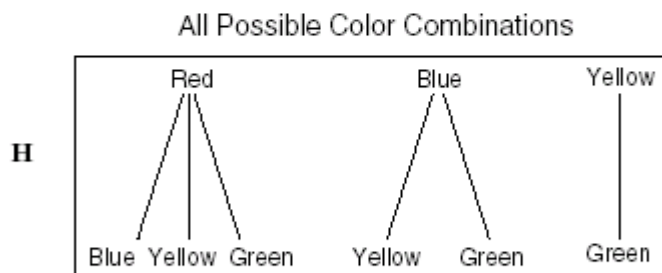
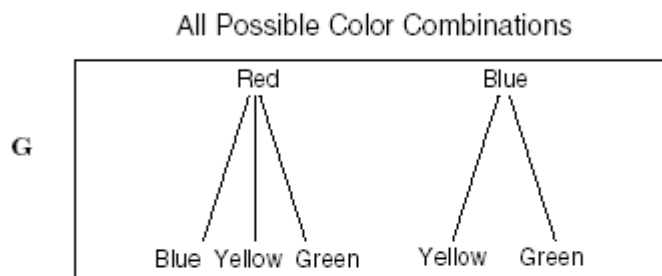
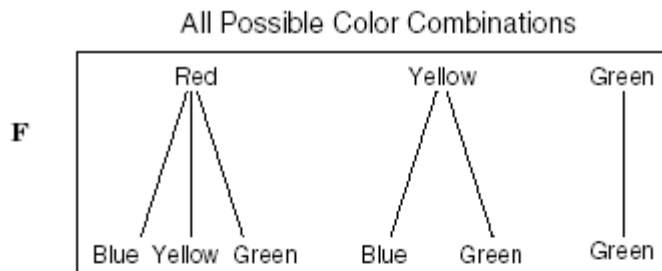
- F** The same number of students received a B as received a D.
- G** Eighteen students received a C or higher.
- H** The same number of students received a D or an F as received an A or a B.
- J** Sixteen students received a C or lower.

6-Objective 5

(6.9) Probability and statistics. The student uses experimental and theoretical probability to make predictions. The student is expected to

(A) construct sample spaces using lists, tree diagrams, and combinations;

22 Charlie had 1 red marble, 1 blue marble, 1 yellow marble, and 1 green marble in a bag. He picked 2 marbles at random from the bag. Which diagram shows all the possible color combinations of the 2 marbles that Charlie picked?



6-Objective 5

6.9(B) find the probabilities of a simple event and its complement and describe the relationship between the two.

25 Scott has 5 green marbles, 8 red marbles, 2 purple marbles, and 6 blue marbles in a container. If he draws a marble at random from the container, what is the probability that he will NOT draw a blue marble?

A $\frac{1}{4}$

B $\frac{2}{7}$

C $\frac{5}{7}$

D $\frac{3}{4}$

6.10(B) use median, mode, and range to describe data;

26 Mr. Franks recorded these mathematics test scores of his sixth-grade students.

67, 69, 71, 73, 74, 75, 79, 81, 81, 82, 83, 87, 88, 88, 88, 88, 90, 91, 93, 95, 99, 100

What is the median of these test scores?

F 83

G 85

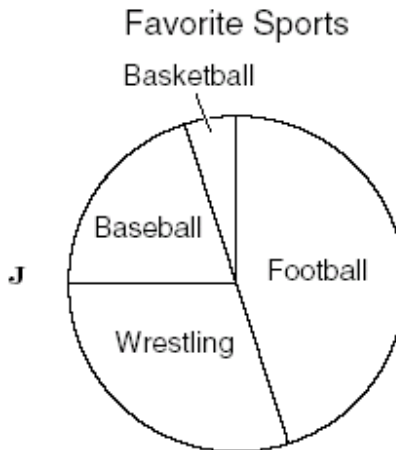
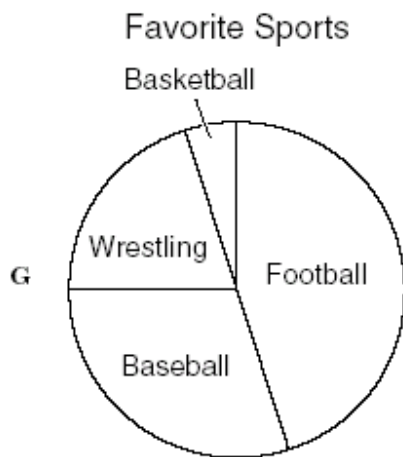
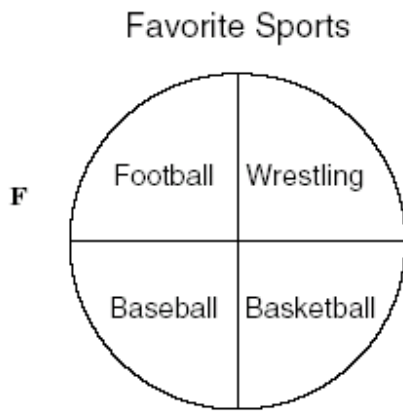
H 87

J 88

6-Objective 5

6.10(C) sketch circle graphs to display data;

46 Of the 100 people An Li surveyed about their favorite sport, 45 said football, 30 said wrestling, 20 said baseball, and 5 said basketball. Which circle graph best displays the data?



6-Objective 6: The student will demonstrate an understanding of the mathematical processes and tools used in problem solving.

(6.11) Underlying processes and mathematical tools. The student applies Grade 6 mathematics to solve problems connected to everyday experiences, investigations in other disciplines, and activities in and outside of school. The student is expected to

(C) select or develop an appropriate problem-solving strategy from a variety of different types, including drawing a picture, looking for a pattern, systematic guessing and checking, acting it out, making a table, working a simpler problem, or working backwards to solve a problem.

2 When Marco's dog got loose, it ran $\frac{1}{3}$ mile on Pine Street, $1\frac{1}{2}$ miles on Oak Street, and $2\frac{5}{6}$ miles on Hickory Street. Which procedure can Marco use to find the total distance in miles that his dog ran?

F Multiply the sum of the whole numbers by the sum of the fractions, using a common denominator when necessary

G Find the difference between the sum of the whole numbers and the sum of the fractions, using a common denominator when necessary

H Add the sum of the whole numbers and the sum of the fractions, using a common denominator when necessary

J Divide the sum of the whole numbers by the sum of the fractions, using a common denominator when necessary

6.11(A) identify and apply mathematics to everyday experiences, to activities in and outside of school, with other disciplines, and with other mathematical topics;

3 Cindy and 2 friends ordered a large pizza for \$9.00, 3 large drinks for \$0.99 each, and a salad for \$1.50. If they split these costs evenly, which equation can be used to find c , the amount in dollars and cents each person should pay, not including tax?

A $c = 9.00 + 0.99 + 1.50 \div 3$

B $c = 9.00 + 3 \times 0.99 + (1.50 \div 3)$

C $c = (9.00 + 0.99 + 1.50) \div 2$

D $c = (9.00 + 3 \times 0.99 + 1.50) \div 3$

(6.13) Underlying processes and mathematical tools. The student uses logical reasoning to make conjectures and verify conclusions. The student is expected to

(B) validate his/her conclusions using mathematical properties and relationships.

8 Laurence was asked to find 2 integers that have a difference of 1 and a sum of 59. He said the integers were 29 and 28. Why was Laurence's answer incorrect?

F The difference between 29 and 28 is not 1.

G The difference between 29 and 28 is 1.

H The sum of 29 and 28 is 59.

J The sum of 29 and 28 is not 59.

6-Objective 6

(6.12) Underlying processes and mathematical tools. The student communicates about Grade 6 mathematics through informal and mathematical language, representations, and models. The student is expected to

(A) communicate mathematical ideas using language, efficient tools, appropriate units, and graphical, numerical, physical, or algebraic mathematical models.

11 Mr. Ortega gave his social studies students a map of Texas. According to the map scale, 1 inch on the map represents 100 actual miles. Which strategy can Mr. Ortega's students use to find the actual distance in miles between points on the map?

- A Measure the number of inches between points and then divide by 100
- B Measure the number of inches between points and then multiply by 100
- C Measure the number of inches between points and then subtract 100
- D Measure the number of inches between points and then add 100

6.11(B) use a problem-solving model that incorporates understanding the problem, making a plan, carrying out the plan, and evaluating the solution for reasonableness;

13 Stan must buy paper plates and plastic forks for a picnic. Plates are sold in packages of 8 and forks in packages of 12. What is the least number of packages of plates and packages of forks that Stan can buy to have an equal number of plates and forks?

- A 2 packages of plates and 3 packages of forks
- B 3 packages of plates and 2 packages of forks
- C 4 packages of plates and 6 packages of forks
- D 6 packages of plates and 4 packages of forks

6-Objective 6

6.13(A) make conjectures from patterns or sets of examples and nonexamples;

17 The side lengths and perimeters of some regular polygons are shown in the table below.

Regular Polygons

Side Length (inches)	Perimeter (inches)
4	20
6	30
8	40
10	50

Which geometric figure is represented by the information in the table?

- A Pentagon
- B Square
- C Hexagon
- D Triangle

6.12(A) communicate mathematical ideas using language, efficient tools, appropriate units, and graphical, numerical, physical, or algebraic mathematical models.

31 Each number in the sequence below has the same relationship to the number immediately before it.

24, 12, 6, 3, $1\frac{1}{2}$, ...

How can the next number in the sequence be found?

- A By subtracting 12 from the previous number
- B By adding $1\frac{1}{2}$ to the previous number
- C By multiplying the previous number by 2
- D By dividing the previous number by 2

6-Objective 6

6.11(A) identify and apply mathematics to everyday experiences, to activities in and outside of school, with other disciplines, and with other mathematical topics;

33 The weight limit for an elevator is 2,000 pounds. Which statement is best supported by this information?

- A** The elevator can carry more than 20 adults.
- B** The elevator can carry more than 20 crates that weigh 100 pounds each.
- C** The elevator can carry up to 8 people who each weigh as much as 250 pounds.
- D** The elevator can carry twice as many children as adults.

6.11(B) use a problem-solving model that incorporates understanding the problem, making a plan, carrying out the plan, and evaluating the solution for reasonableness;

41 Antonio saved \$30 to go to a carnival. He needs a certain amount of money for bus fare and admission. Antonio wants to find the amount of money he will have left for rides and food. Look at the problem-solving steps shown below. Arrange the steps in the correct order for Antonio to find the amount of money he will have left for rides and food.

Step P: Identify the cost of bus fare and then the cost of admission.

Step Q: Find the difference between \$30 and the sum of the costs of bus fare and admission.

Step R: Find the sum of the costs of bus fare and admission.

Which list shows the steps in the correct order?

- A** P, Q, R
- B** Q, P, R
- C** P, R, Q
- D** Q, R, P

Texas Assessment of Knowledge and Skills - Answer Key

Grade: 06
Subject: Mathematics
Administration: Spring 2003

Item Number	Correct Answer	Objective Measured	Student Expectations
01	B	05	6.10 (A)
02	H	06	6.11 (C)
03	D	06	6.11 (A)
04	F	03	6.6 (A)
05	D	03	6.6 (A)
06	G	05	6.10 (D)
07	D	01	6.1 (A)
08	J	06	6.13 (B)
09	B	04	6.8 (D)
10	H	02	6.3 (C)
11	B	06	6.12 (A)
12	H	01	6.2 (A)
13	B	06	6.11 (B)
14	J	01	6.1 (D)
15	B	02	6.3 (C)
16	G	01	6.1 (A)
17	A	06	6.13 (A)
18	J	02	6.3 (B)
19	B	04	6.8 (C)
20	H	01	6.1 (B)
21	91	04	6.8 (B)
22	H	05	6.9 (A)
23	D	04	6.8 (B)
24	G	02	6.3 (A)
25	C	05	6.9 (B)
26	G	05	6.10 (B)
27	C	03	6.6 (C)
28	F	02	6.4 (A)
29	D	02	6.5 (A)
30	G	03	6.6 (B)
31	D	06	6.12 (A)
32	G	01	6.2 (C)
33	C	06	6.11 (A)
34	F	04	6.8 (A)
35	B	02	6.3 (A)
36	H	01	6.1 (C)
37	B	02	6.4 (B)
38	F	01	6.1 (E)
39	A	03	6.7 (A)
40	G	03	6.6 (B)
41	C	06	6.11 (B)
42	F	01	6.2 (B)
43	C	03	6.7 (A)
44	H	01	6.2 (D)
45	A	02	6.5 (A)
46	J	05	6.10 (C)