Name _____ Date _____ Class _____

COURSE 1

Diagnostic Assessment

Number and Quantitative Reasoning

1. Identify the place value of the underlined digit 6,70<u>4</u>,456.

A millions

B hundred thousands

C ten thousands

D thousands

2. Which is three million, two hundred fifty-two thousand, twelve written in standard form?

F 3,250,112

G 3,252,012

H 3,000,250,012

J 3,250,000,112

3. Round 48,529 to the nearest ten.

A 48,520 **C** 48,530

B 48,525 **D** 48,600

4. Which statement is true?

F $72{,}772 > 77{,}277$

G $84{,}563 < 84{,}653$

H $3{,}061 > 3{,}072$

J $3{,}245 > 4{,}999$

5. Which set of numbers is ordered from least to greatest?

A 83, 71, 53, 35, 17

B 17, 35, 53, 71, 83

C 17, 53, 35, 71, 83

D 35, 53, 17, 71, 83

6. Identify the number set that contains the number 15.

F counting, whole, even

G counting, whole, odd

H counting, whole, factor of 4

J counting, even

7. Which list contains the first three multiples of the number 7?

A 7, 8, 9

B 7, 14, 21

C 7, 17, 27

D 7, 70, 700

8. Which list contains all the factors of 16?

F 1, 16, 32

G 1, 2, 4, 8, 16

H 1, 16

J 1, 2, 4, 6, 8, 16

9. Which number is not prime?

A 7 **C** 17

B 11 **D** 21

10. Which number is prime?

F 25 **H** 61

G 39 **J** 72

11. Evaluate 15^2.

A 13 **C** 152

B 30 **D** 225

12. Find the value of 5^3.

F 15 **H** 125

G 53 **J** 1125

13. Find the next three numbers in the pattern.

16, 20, 24, 28…

A 30, 32, 34

B 32, 36, 40

C 31, 33, 35

D 46, 92, 184

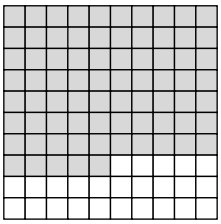
Name _____ Date _____ Class _____

COURSE 1

Diagnostic Assessment

Number and Quantitative Reasoning, continued

14. What number is represented by the shaded portion of the grid?



F $\frac{1}{4}$ **H** $\frac{4}{5}$

G 0.25 **J** 0.75

15. What is 92.15 in word form?

A nine, two, one five

B ninety-two and fifteen hundredths

C ninety-two and one-five thousandths

D ninety-two and fifteen tenths

16. Round 27.62 to the nearest whole number.

F 27 **H** 27.6

G 28 **J** 28.1

17. Which set of numbers is ordered from greatest to least?

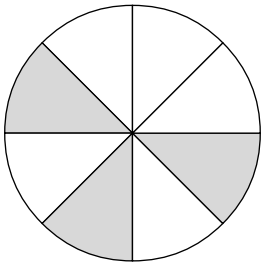
A 14.2, 14.1, 12.3, 12.1

B 14.1, 14.2, 12.3, 12.1

C 12.1, 12.3, 14.2, 14.1

D 12.1, 12.3, 14.1, 14.2

18. Write the fraction for the shaded part of the circle.



F $\frac{2}{3}$ **H** $\frac{3}{8}$

G $\frac{1}{2}$ **J** $\frac{3}{7}$

19. Simplify $\frac{12}{16}$.

A $\frac{1}{3}$ **C** $\frac{1}{2}$

B $\frac{2}{3}$ **D** $\frac{3}{4}$

20. Round $\frac{1}{9}$ to the nearest benchmark fraction.

F 0 **H** 1

G $\frac{1}{2}$ **J** cannot round

21. Write $\frac{13}{3}$ as a mixed number.

A $4\frac{1}{4}$ **C** $5\frac{1}{2}$

B $4\frac{1}{3}$ **D** $\frac{3}{13}$

22. Write an improper fraction equal to $2\frac{1}{4}$.

F $\frac{21}{4}$ **H** $\frac{3}{4}$

G $\frac{9}{4}$ **J** $\frac{9}{3}$

Name _____ Date _____ Class _____

COURSE 1

Diagnostic Assessment

Number and Quantitative Reasoning, continued

23. Find a common denominator for $\frac{1}{8} + \frac{1}{12}$.

A 12 **C** 24

B 16 **D** 76

24. Which number should replace the question mark to make the statement true?

$\frac{2}{3} = \frac{?}{15}$

F 5 **H** 15

G 10 **J** 20

25. Compare $3\frac{1}{4} \square 3\frac{1}{5}$.

A $>$ **C** $=$

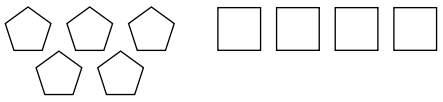
B $<$

26. Change $\frac{7}{8}$ to a decimal.

F 0.07 **H** 0.875

G 0.78 **J** 7

27. Which is the ratio of pentagons to squares?



A 5:4 **C** 5:1

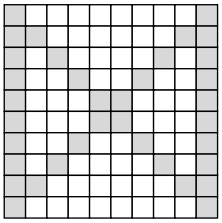
B 4:5 **D** 1:5

28. Simplify: 10 oranges to 2 lemons.

F 4:3 **H** 5:1

G 3:4 **J** 1:5

29. Which percent can be used to describe the shaded part of the grid?



A 16% **C** 36%

B 32% **D** 64%

30. Change 0.15 to a percent.

F 0.15% **H** 15%

G 1.5% **J** 1,500%

31. Change $\frac{40}{50}$ to a percent.

A 20% **C** 50%

B 40% **D** 80%

32. Which statement is true?

F $\frac{1}{2} < 0.25$

G $75\% > \frac{3}{5}$

H $\frac{1}{2} < 25\%$

J $50\% = 5.0$

33. Which integer represents a loss of $12?

A −$12

B $12

C $0

D −$120

Name _____ Date _____ Class _____

COURSE 1 Diagnostic Assessment
Operations

34. Find the quotient. $6\overline{)70}$

F 10 r 4 **H** 11 r 4
G 10 r 10 **J** 12

35. Find the product. $4 \times 4 \times 4$

A 12 **C** 176
B 64 **D** 444

36. Multiply. 9×8

F 17 **H** 72
G 64 **J** 98

37. $\frac{64}{100} = \frac{?}{}$

A 6.4 **C** 0.064
B 0.64 **D** 64

38. Divide. $92 \div 4$

F 13 **H** 22
G 21 **J** 23

39. Divide $8\overline{)140}$. Write any remainder as a decimal.

A 16.3 **C** 132
B 17.5 **D** 1,120

40. Multiply. $\begin{array}{r} 6.8 \\ \times 0.5 \\ \hline \end{array}$

F 3.4 **H** 34
G 7.3 **J** 340

41. Multiply. 100×3.6

A 3.6 **C** 360
B 36 **D** 3,600

42. Add. $\begin{array}{r} \frac{5}{8} \\ +\frac{1}{4} \\ \hline \end{array}$

F $\frac{5}{32}$ **H** $\frac{3}{4}$
G $\frac{1}{2}$ **J** $\frac{7}{8}$

43. $\frac{3}{4} - \frac{1}{4}$

A 0 **C** $\frac{3}{4}$
B $\frac{1}{2}$ **D** 2

44. Multiply $\frac{1}{2} \times \frac{4}{5}$. Write the answer in simplest form.

F $\frac{2}{5}$ **H** $\frac{5}{7}$
G $\frac{3}{5}$ **J** 1

45. Multiply. $\frac{1}{4} \times 8$

A 1 **C** 4
B 2 **D** 32

46. What is 25% of 80?

F 20 **H** 60
G 40 **J** 75

47. Subtract. $(-12) - 2$

A -14 **C** 10
B -10 **D** 14

Name _____ Date _____ Class _____

COURSE 1 Diagnostic Assessment
Algebra

48. Identify the property shown.
$8 \times 1 = 8$

F Commutative Property of Multiplication

G Associative Property of Multiplication

H Multiplication Property of One

J Multiplication Property of Zero

49. Which is the correct use of the Distributive Property to find the product 3×11?

A $(3 + 10) \times (3 + 1)$

B 3×11

C $(3 \times 10) \times (3 \times 1)$

D $(3 \times 10) + (3 \times 1)$

50. Evaluate. $10 - (3 + 5)$

F -5 **H** 15

G 2 **J** 18

51. Evaluate. $3^2 + (9 - 1)$

A -2 **C** 16

B 12 **D** 17

52. $2(5.2)(3) =$ _____

F 10.12 **H** 26

G 13.4 **J** 31.2

53. Which expression represents the product of 6 and a number?

A $6w$

B $w + 6$

C $w - 6$

D $w \div 6$

54. Evaluate the expression $3x + 2$ for $x = 4$.

F 9 **H** 24

G 14 **J** 36

55. Simplify. $3x + 4x + 6$

A $12x + 6$ **C** $7x + 6$

B $13x$ **D** $13 + x$

56. Which algebraic equation describes the expression "6 plus a number is 8"?

F $6n = 8$ **H** $n + 6 = 8$

G $6 \div n = 8$ **J** $n - 6 = 8$

57. Use inverse operations to solve the equation. $n + 10 = 16$

A $n = -6$ **C** $n = 6$

B $n = 1.\overline{6}$ **D** $n = 26$

58. Solve. $a - 8 = 23$

F $a = 2.875$ **H** $a = 31$

G $a = 15$ **J** $a = 184$

59. Solve. $7x = 49$

A $x = 7$ **C** $x = 56$

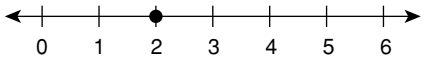
B $x = 42$ **D** $x = 343$

60. Solve. $3h - 2 = 4$

F $h = -2$ **H** $h = 2$

G $h = 0.\overline{6}$ **J** $h = 3$

61. Identify the point graphed on the number line.



A -2 **C** 3

B 2 **D** 4

Name _____ Date _____ Class _____

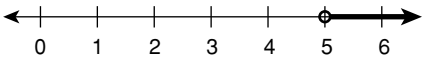
COURSE 1

Diagnostic Assessment

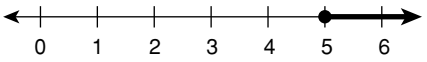
Algebra, continued

62. Which graph is the solution to the inequality $x + 3 \geq 8$?

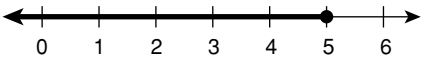
F



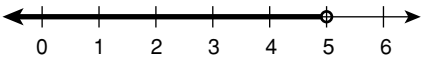
G



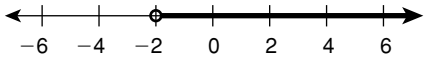
H



J



63. Which inequality represents the graph?

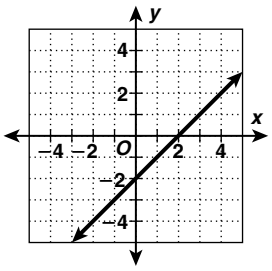


A $x > -2$ **C** $x < -2$

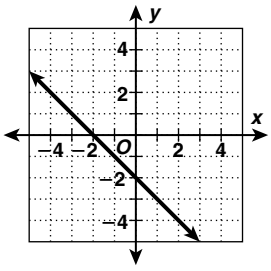
B $x \geq -2$ **D** $x \leq -2$

64. Which graph corresponds to the equation $y = x + 2$?

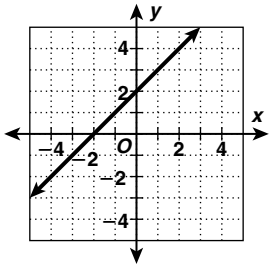
F



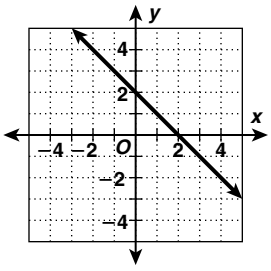
G



H



J



65. Solve for the value of a. $\frac{a}{10} = \frac{2}{5}$

A $a = 25$ **C** $a = 4$

B $a = 15$ **D** $a = 2$

66. 24 in. = _____ ft

F 1 **H** 3

G 2 **J** 6

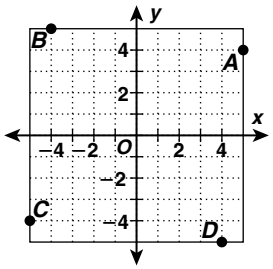
67. Which term completes the function table?

Input	Algebraic Expression	Output
n	$3n$	
2		6
4		12
6		??

A 14 **C** 26

B 18 **D** 36

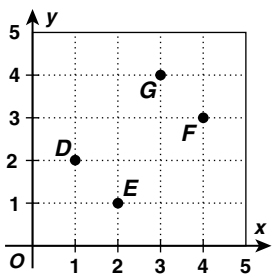
68. What is the ordered pair for point D?



F (5, 4) **H** (−5, −4)

G (−4, 5) **J** (4, −5)

69. What is the ordered pair for point F?



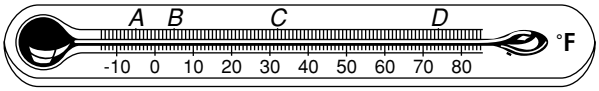
A (1, 2) **C** (4, 3)

B (2, 1) **D** (3, 4)

Name _____ Date _____ Class _____

COURSE 1 Diagnostic Assessment
Measuring

70. What temperature is shown by the letter *C*?



F 32°
H 74°
G 5°
J −5°

71. Change to the given unit.

8 c = _____ pt

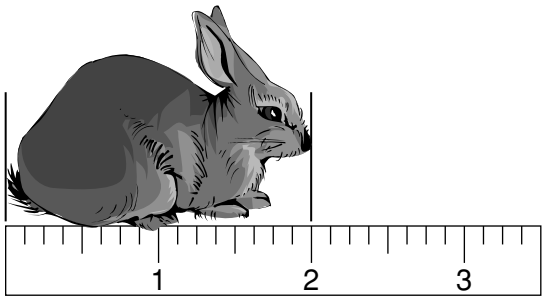
A 2
C 16
B 4
D 24

72. Change to the given unit.

17,000 mg = _____ g

F 1,700
H 17
G 170
J 1.7

73. What is the length of the rabbit?



A 1 inch
C $1\frac{3}{4}$ inches
B $1\frac{1}{4}$ inches
D 2 inches

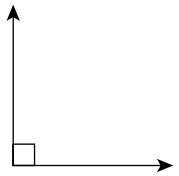
Name _____ Date _____ Class _____

COURSE 1

Diagnostic Assessment

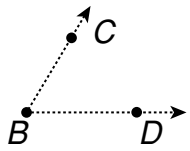
Geometry

74. Classify the angle shown.



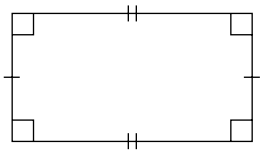
F right
G acute
H obtuse
J straight

75. Name the angle formed by the dashed rays.



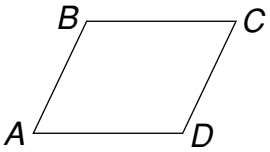
A $\angle CBD$
B $\angle BCA$
C $\angle BCD$
D $\angle DCB$

76. Identify the figure shown.



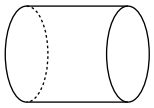
F trapezoid
G rectangle
H rhombus
J square

77. Name an acute angle in the polygon.



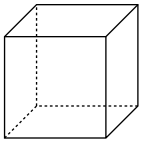
A $\angle ABC$
B $\angle CAB$
C $\angle BCD$
D $\angle ACB$

78. Identify the solid figure.



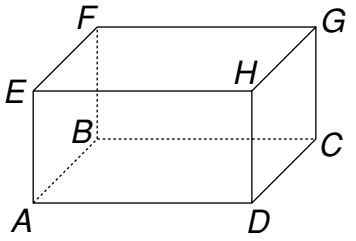
F rectangular prism
G rectangular pyramid
H cone
J cylinder

79. Identify the number of faces, edges and vertices.



A faces = 4, edges = 8, vertices = 10
B faces = 6, edges = 10, vertices = 8
C faces = 4, edges = 8, vertices = 6
D faces = 6, edges = 12, vertices = 8

80. Which line intersects $\overleftrightarrow{AB}$?



F $\overleftrightarrow{AD}$
G $\overleftrightarrow{CD}$
H $\overleftrightarrow{FG}$
J $\overleftrightarrow{HG}$

Name _____ Date _____ Class _____

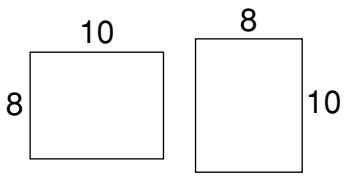
COURSE 1

Diagnostic Assessment

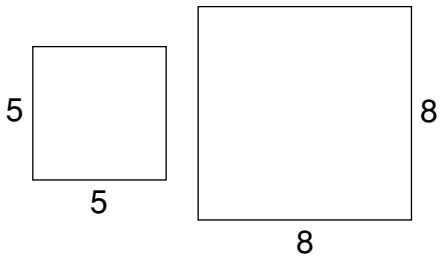
Geometry, continued

81. Identify the set of figures that are congruent.

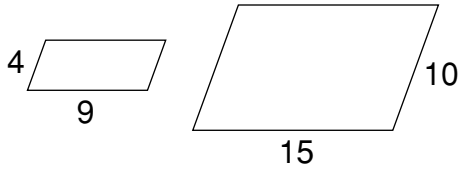
A



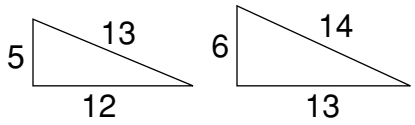
B



C

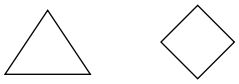


D

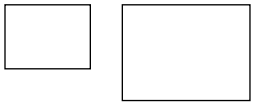


82. Identify the pair of figures that appear to be similar.

F

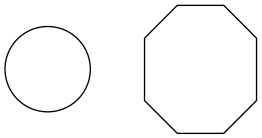


G

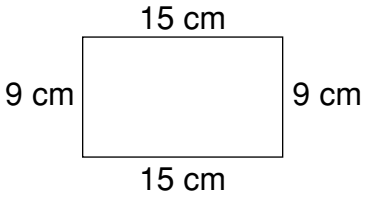


H

J

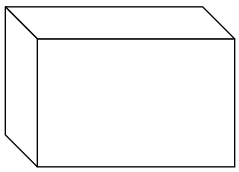


83. Find the perimeter of the figure.



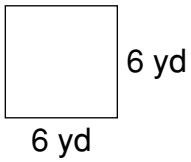
A 24 cm
B 48 cm
C 90 cm
D 96 cm

84. Identify the figure shown.



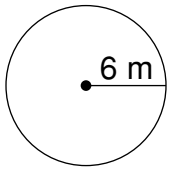
F triangular prism
G triangular pyramid
H rectangular prism
J rectangular pyramid

85. Find the area of the figure.



A 12 yd^2
B 24 yd^2
C 36 yd^2
D 72 yd^2

86. Find the area of the figure.



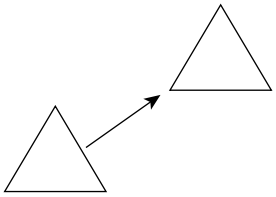
F 18.84 m^2
G 37.68 m^2
H 113.04 m^2
J 452.16 m^2

Name _____ Date _____ Class _____

COURSE 1 Diagnostic Assessment

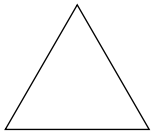
Geometry, continued

87. Identify the transformation.



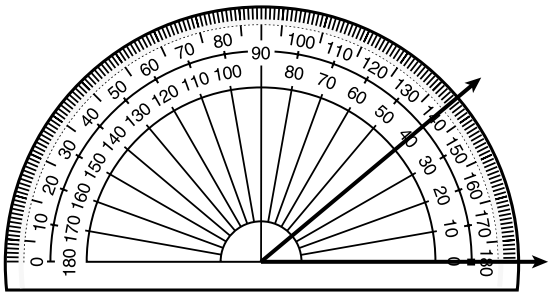
A translation
C reflection
B rotation
D transdermal

88. Identify the number of lines of symmetry in the figure.



F 1
H 3
G 2
J 4

89. What is the measure of the angle?



A 40°
C 140°
B 50°
D 180°

Name _____ Date _____ Class _____

COURSE 1 Diagnostic Assessment

Statistics and Data Analysis

90. Use the data in the table to answer the question.

	Boys	Girls
Math	7	5
English	4	8
Art	2	11
Science	13	9

Which is the favorite class among boys surveyed?

F Math **H** Art

G English **J** Science

91. What is the range of the data set? 83, 68, 87, 74, 88

A 20 **C** 80

B 68 **D** 83

92. What is the median of the data set? 8, 6, 4, 6, 8, 2

F 8 **H** 4

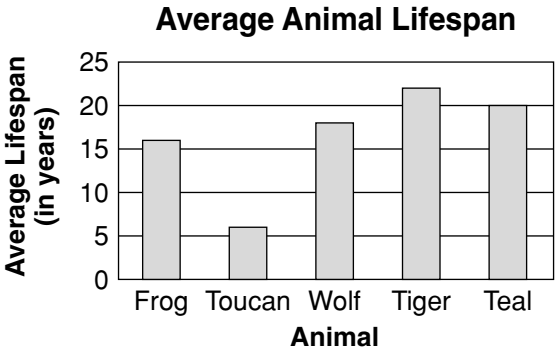
G 6 **J** 2

93. What is the mean of the data set? 8, 12, 7, 16, 10, 7

A 6 **C** 9

B 7 **D** 10

94. Use the bar graph to answer the question.

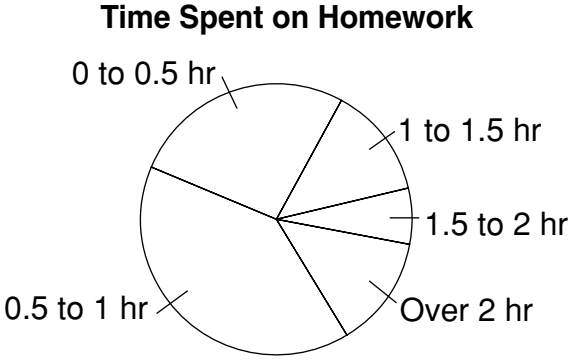


What is the average lifespan of a teal?

F 7 years **H** 20 years

G 17 years **J** 25 years

95. Use the circle graph to answer the question.



What is the most common amount of time spent on homework?

A 0 to $\frac{1}{2}$ hour **C** $1\frac{1}{2}$ to 2 hours

B $\frac{1}{2}$ to 1 hour **D** over 2 hours

Name _____ Date _____ Class _____

COURSE 1

Diagnostic Assessment

Statistics and Data Analysis, continued

96. Use the stem-and-leaf plot to answer the question.

Test Scores

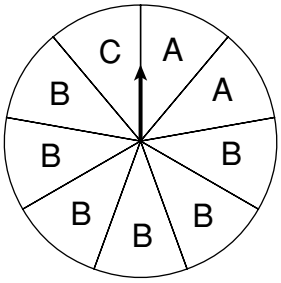
Stem	Leaves
7	0 1 3
8	2 2 3 4
9	3 3 3 7

What is the median of the test scores?

F 70 **H** 83

G 82 **J** 97

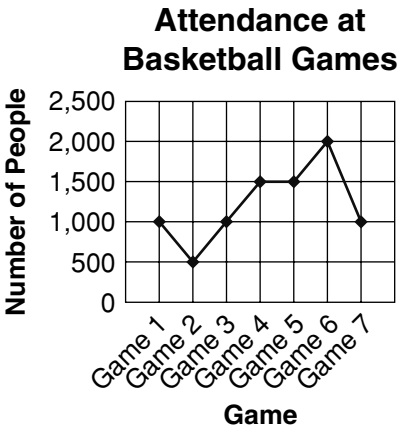
97. What is the likelihood of spinning the letter B?



A certain **C** likely

B impossible **D** unlikely

98. How many more people attended Game 4 than Game 2?



F 500 **H** 1,500

G 1,000 **J** 2,000

COURSE 1

Diagnostic Assessment

Answers

Number and Quantitative Reasoning

1. D
2. G
3. C
4. G
5. B
6. G
7. B
8. G
9. D
10. H
11. D
12. H
13. B
14. J
15. B
16. G
17. A
18. H
19. D
20. F
21. B
22. G
23. C
24. G
25. A
26. H
27. A
28. H
29. C
30. H
31. D
32. G
33. A

Operations

34. H
35. B
36. H
37. B
38. J
39. B
40. F
41. C
42. J
43. B
44. F
45. B
46. F
47. A

Algebra

48. H
49. D
50. G
51. D
52. J
53. A
54. G
55. C
56. H
57. C
58. H
59. A
60. H
61. B
62. G
63. A
64. H
65. C
66. G
67. B
68. J
69. C

Measuring

70. F
71. B
72. H
73. D

Goemetry

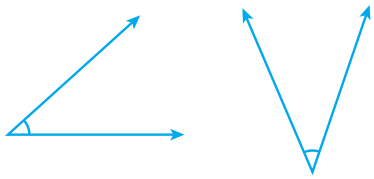
74. F
75. A
76. G
77. C
78. J
79. D
80. F
81. A
82. G
83. B
84. H
85. C
86. H
87. A
88. H
89. A

Statistics and Data Analysis

90. J
91. A
92. G
93. D
94. H
95. B
96. H
97. C
98. G

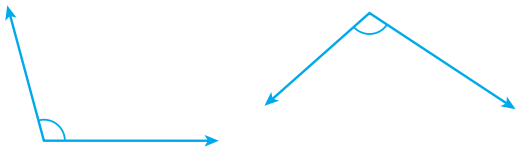
7-2 Angles

An **acute angle** measures less than 90°.



A **right angle** measures exactly 90°.

An **obtuse angle** measures more than 90° and less than 180°.

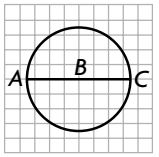


A **straight angle** measures exactly 180°.

Area of Circles

Skill 86

Use the formula to find the area of each of the circles.

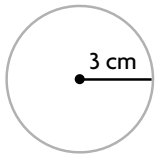


Understanding the Formula

Area is the number of square units needed to cover a surface. Remember: The ratio of the circumference to the diameter ($\frac{C}{d}$) is called pi. The value of *pi* is approximately 3.14 or $\frac{22}{7}$. To find the area, multiply the value of *pi* by the length of the radius squared. Express the area using the symbol ≈ which means approximately equal to.
Formula: $A = \pi r^2$

Using the Formula

Find the area of each circle.



$A = \pi r^2$

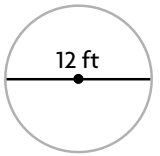
$A \approx 3.14 \times (3)^2$ Replace π with 3.14 and r with 3.

$A \approx 3.14 \times 9$ Multiply.

$A \approx 28.26$

Rounded to the nearest centimeter, the area is about 28 cm^2.

First, find the radius.



$A = \pi r^2$

$A \approx \frac{22}{7} \times (6)^2$ Replace π with $\frac{22}{7}$ and r with 6.

$A \approx \frac{22}{7} \times 36$ $A \approx \frac{22}{7} \times \frac{36}{1}$

$A \approx \frac{792}{7}$

$A \approx 113.1428 \ldots$

Rounded to the nearest foot, the area is about 113 ft^2.

Try These

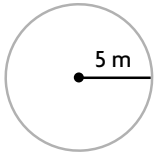
Find the area. Round to the nearest whole number.

1 $A = \pi r^2$

$A \approx 3.14 \times (\_\_\_)^2$

$A \approx 3.14 \times \_\_\_$

$A \approx \_\_\_\_\_ m^2$



2 $A = \pi r^2$

$A \approx \frac{22}{7} \times (\_\_\_)^2$

$A \approx \frac{22}{7} \times \frac{\square}{1}$

Simplify.

$A \approx \_\_\_ \times \_\_\_$

$A \approx \_\_\_\_\_ in.^2$

3 Find the radius.

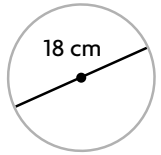
$r = \_\_\_\_\_$

$A = \pi r^2$

$A \approx 3.14 \times (\_\_\_)^2$

$A \approx 3.14 \times \_\_\_$

$A \approx \_\_\_\_\_ cm^2$



Go to the next side.

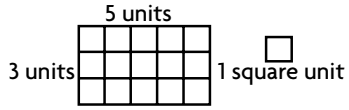
Name _____ Skill

Name _____ Skill

Area of Squares, Rectangles, Triangles

Skill 85

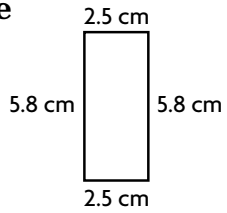
Area is the number of square units needed to cover a surface.
Use formulas to find the areas of rectangles, squares, and triangles.



3 units × 5 units = 15 square units

Area of a Rectangle

You can use this formula to find the area of a rectangle.



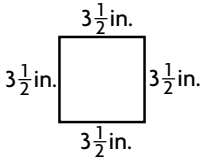
Area of Rectangle
= length × width
$A = \ell \times w$

Then: Replace ℓ with 2.5.
$A = \ell \times w$ Replace w with 5.8.
$= 2.5 \times 5.8$
$= 14.5$ sq cm

So, the area of the rectangle is 15.5 cm^2.

Area of a Square

A square is a rectangle with sides all the same length.



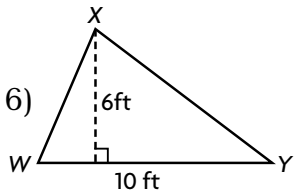
So, you can use this formula to find the area of a square:
Area of square = side × side
$A = s \times s$ or $A = s^2$ Replace s
$= 3\frac{1}{2} \times 3\frac{1}{2}$ with $3\frac{1}{2}$.
$= 12\frac{1}{4}$

So, the area of the square is $12\frac{1}{4}$ in^2.

Area of a Triangle

Use this formula to find the area of a triangle.

$A = \frac{1}{2} bh$
$= \frac{1}{2} \times (10 \times 6)$
$= \frac{1}{2} \times 60$
$= 30$ ft^2



So, the area of triangle WXY is 30 ft^2.

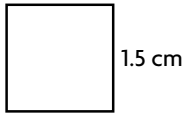
Try These

Find the area.

1 $A = \ell \times w$
$=$ ____ × ____
$=$ ____

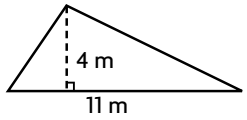
Area is ____ $in.^2$

2 $A = s \times s$
$=$ ____ × ____
$=$ ____



Area is ____ cm^2.

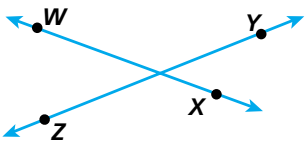
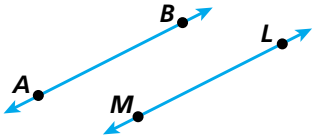
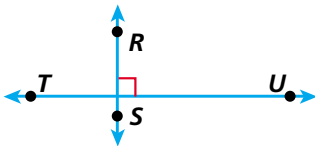
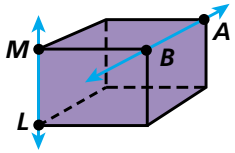
3 $A = \frac{1}{2} bh$
$= \frac{1}{2} \times$ (____ × ____)
$= \frac{1}{2} \times$ ____
$=$ ____



Area is ____ m^2.

Go to the next side.

7-4 Classifying Lines

Intersecting lines are lines that cross at one common point.		Line *YZ* intersects line *WX*. $\overleftrightarrow{YZ}$ intersects $\overleftrightarrow{WX}$.
Parallel lines are lines in the same plane that never intersect.		Line *AB* is parallel to line *ML*. $\overleftrightarrow{AB} \parallel \overleftrightarrow{ML}$
Perpendicular lines intersect to form 90° angles, or right angles.		Line *RS* is perpendicular to line *TU*. $\overleftrightarrow{RS} \perp \overleftrightarrow{TU}$.
Skew lines are lines that lie in different planes. They are neither parallel nor intersecting.		Line *AB* and line *ML* are skew. $\overleftrightarrow{AB}$ and $\overleftrightarrow{ML}$ are skew.

Name _____ Skill

Evaluate Expressions

Skill 54

You can **evaluate**, or find the value of, an expression by using the order of operations.

Order of Operations

1. Operate inside parentheses.
2. Evaluate terms with exponents.
3. Multiply and divide from left to right.
4. Add and subtract from left to right.

Evaluate $2b + 3$ for $b = {}^{-}4$.

$2b + 3$ Replace b with $^{-}4$.

$\downarrow$

$2 \bullet {}^{-}4 + 3$ Multiply first.
Think: $2 \bullet {}^{-}4 = {}^{-}8$

${}^{-}8 + 3$ Then add.
Think: ${}^{-}8 + 3 = {}^{-}5$

${}^{-}5$

So, when $b = {}^{-}4$, the value of $2b + 3$ is $^{-}5$.

Evaluate $\frac{2a}{3} - 4$ for $a = 9$.

$\frac{2a}{3} - 4$ Replace a with 9.

$\downarrow$

$\frac{2 \bullet 9}{3} - 4$ Multiply first.
Think: $2 \bullet 9 = 18$

$\frac{18}{3} - 4$ Then divide.
Think: $18 \div 3 = 6$

$6 - 4$ Finally, subtract.
Think: $6 - 4 = 2$

2

So, when $a = 9$, the value of $\frac{2a}{3} - 4$ is 2.

Evaluate $5(s + 3)^2$ for $s = 2$.

$5(s + 3)^2$ Replace s with 2.

$\downarrow$

$5(2 + 3)^2$ Operate inside parentheses.
Think: $2 + 3 = 5$

$5 \bullet 5^2$ Evaluate 5^2.
Think: $5^2 = 5 \times 5$, or 25

$5 \bullet 25$ Multiply.

125 **Think:** $5 \bullet 25 = 125$

So, when $s = 2$, the value of $5(s + 3)^2$ is 125.

Try These

Evaluate the expression for the given value of the variable. Write each step.

1 $a = 5$

$4a - 6$ Replace a with 5.

$\downarrow$

$4 \bullet \square - 6$ Multiply.

_____ Subtract.

_____

The value of $4a - 6$ is _____.

2 $b = 4$

$\frac{1 \bullet b}{2} + 1$ Replace b with 4.

$\downarrow$

$\frac{1 \bullet \square}{2} + 1$ Multiply first.

$\frac{\square}{2} + 1$ Divide.

_____ Add.

_____

The value of $\frac{1 \bullet b}{2} + 1$ is _____.

3 $c = 3$

$2(10 - c)^2$ Replace c with 3.

$2(10 - \square)^2$ Operate inside parentheses.

_____ Evaluate term with exponent.

_____ Multiply.

_____

The value of $2(10 - c)^2$ is _____.

Go to the next side.

Name _____

Skill 76

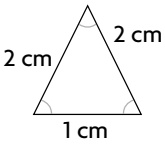
Identify Polygons

A **polygon** is a closed plane figure formed by three or more line segments. Polygons are named by the number of their sides and angles.

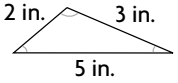
Remember:
A line segment is part of a line between two endpoints.

Triangles

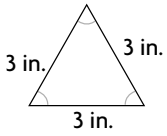
Triangles are polygons with 3 sides and 3 angles.
Classify triangles by the lengths of their sides or by the measures of their angles.



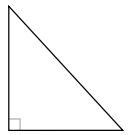
Isosceles
2 sides are congruent.



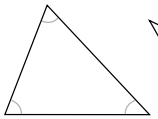
Scalene
All sides are different lengths.



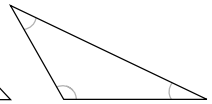
Equilateral
All sides are congruent.



Right
one right angle



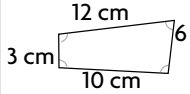
Acute
three acute angles



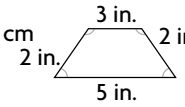
Obtuse
one obtuse angle

Quadrilaterals

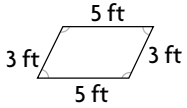
Quadrilaterals are polygons with 4 sides and 4 angles.
There are different types of quadrilaterals.



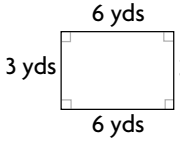
General Quadrilateral
4 sides of any length
4 angles of any size



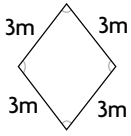
Trapezoid
1 pair of parallel sides



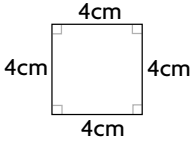
Parallelogram
2 pairs of congruent sides
2 pairs of parallel sides



Rectangle
2 pairs of congruent sides
4 right angles

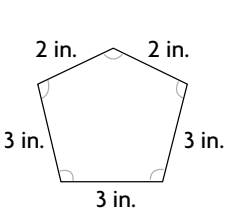


Rhombus
4 congruent sides
2 pairs of congruent angles

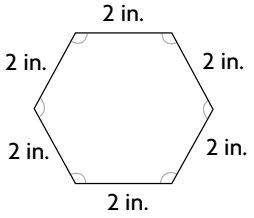


Square
4 congruent sides
4 right angles

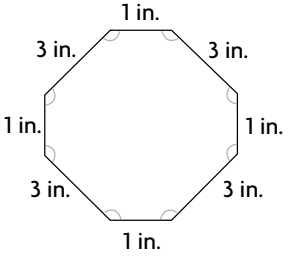
Pentagon, Hexagon, Octagon



Pentagon
5 sides
5 angles
penta means five



Hexagon
6 sides
6 angles
hexa means six



Octagon
8 sides
8 angles
octa means eight

Go to the next side.

Skill _____

Name _____

Skill 51

Order of Operations

Evaluate an expression by using the order of operations.

Order of Operations			
1. Do the operation in parentheses.	**2.** Simplify exponents.	**3.** Multiply and divide from left to right.	**4.** Add and subtract from left to right.

Evaluate $7 + 2 \times 3$.

$2 \times 3 = 6$

$7 + 2 \times 3$ Multiply first.

$7 + 6$ Then add.

13

The value of the expression is 13.

Evaluate $3^2 + (4 \div 2)$.

$2\overline{)4}$

$3^2 + (4 \div 2)$ Operate within parentheses.

$3^2 + 2$ Simplify the exponent.

$3 \times 3 = 9$

$9 + 2$ Add.

11

The value of the expression is 11.

Evaluate $\frac{(4 + 2)}{3} + 4^2$.

$\frac{(4 + 2)}{3} + 4^2$ $4 + 2 = 6$

$\frac{6}{3} + 4^2$ Operate within parentheses.

$\frac{6}{3} + 16$ Simplify the exponent.

$2 + 16$ Divide.

18 Add.

The value of the expression is 18.

Try These

Evaluate each expression. Write what you do.

1. $3 + 8 \div 2$
   First do: _____
   Then do: _____
   The value is _____.

2. $(5 + 3) \times 7$
   First do: _____
   Then do: _____
   The value is _____.

3. $\frac{(12 - 3)}{3} \times 8$
   First do: _____
   Next do: _____
   Then do: _____
   The value is _____.

4. $5^2 - (10 - 6)$
   First do: _____
   Next do: _____
   Then do: _____
   The value is _____.

Go to the next side.

7-1 Points, Lines, and Planes

A **point** is an exact location. 

point *P*
P

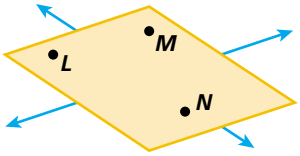
A point is named by a capital letter.

A **line** is a straight path that extends without end in opposite directions.

line *AB*, $\overleftrightarrow{AB}$,
line *BA*, $\overleftrightarrow{BA}$

A line is named by two points on the line.

A **plane** is a flat surface that extends without end in all directions.



plane *LMN*
plane *MLN*
plane *NLM*

A plane is named by three points on the plane that are not on the same line.

A **line segment** is made of two endpoints and all the points between the endpoints.

line segment *XY*, $\overline{XY}$
line segment *YX*, $\overline{YX}$

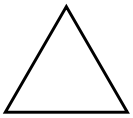
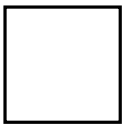
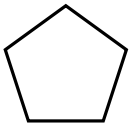
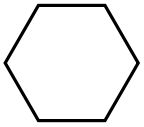
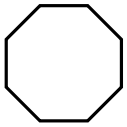
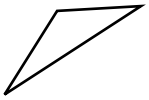
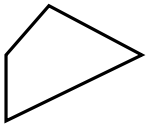
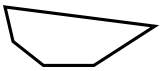
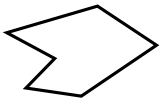
A line segment is named by its endpoints.

A **ray** has one endpoint. From the endpoint, the ray extends without end in one direction only.

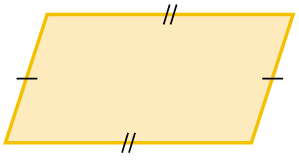
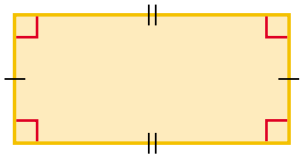
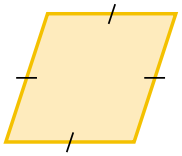
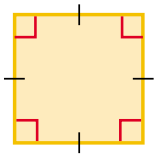
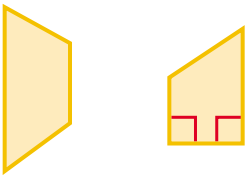
ray *JK*, $\overrightarrow{JK}$

A ray is named by its endpoint first and then another point on the ray.

7-7 Polygons

	Triangle	Quadrilateral	Pentagon	Hexagon	Octagon
Sides and Angles	3	4	5	6	8
Regular					
Not Regular					

7-6 Quadrilaterals

Parallelogram		Opposite sides are parallel and congruent. Opposite angles are congruent.
Rectangle		Parallelogram with four right angles
Rhombus		Parallelogram with four congruent sides.
Square		Rectangle with four congruent sides.
Trapezoid		Quadrilateral with exactly two parallel sides May have two right angles

Name _____ Skill

Simplifying Algebraic Expressions

Skill 55

To simplify algebraic expressions, combine like terms.

Example 1

$5 + 3x - 1$

Put a square around the terms with the variable x and a circle around the constant terms.

(5) [$+ 3x$] (-1)

Combine the terms in each shape.

[$+ 3x$] ($5 - 1$)

$3x + 4$

Example 2

$b + 7 + 6b + 5$

Put a square around the terms with a variable b and a circle around the constant terms.

[b] ($+ 7$) [$+ 6b$] ($+ 5$)

Combine the terms in each shape.

Think: The coefficient of the first b is 1.

[$b + 6b$] ($7 + 5$)

$7b + 12$

Example 3

$3a + 7b - 4 + 9a - 2b$

Put a square around the terms with a variable a, a circle around terms with a variable b, and a triangle around the constant terms.

[$3a$] ($+7b$) △-4 [$+9a$] ($-2b$)

Combine the terms in each shape.

[$3a + 9a$] ($7b - 2b$) △-4

$12a + 5b - 4$

Try These

Simplify each algebraic expression.

1. $7 + 3x - x - 4$

   Terms with x _____

   Constant terms _____

2. $5 + 2a - 7$

   Terms with a _____

   Constant terms _____

3. $8y - 7x + 4 - 2x + 9$

   Terms with x _____

   Terms with y _____

   Constant terms _____

Go to the next side.

Name _____ Skill

Simplifying Numeric Expressions

Skill 52

Simplify each numeric expression. Remember order of operations.

Example 1 Simplify $\frac{1}{2}(8)(3 + 2)$.

$\frac{1}{2}(8)(3 + 2)$ — First, add 3 + 2.

↓

$\frac{1}{2}(8)(5)$ — Then, multiply $\frac{1}{2}$ by 8.

↓

$4(5)$ — Then multiply by 5.

So, $\frac{1}{2}(8)(3 + 2) = 20$.

Example 2 Simplify $\frac{1}{2}(4)^2(8)$.

$\frac{1}{2}(4)^2(8)$ — Simplify the exponent.

↓

$\frac{1}{2}(16)(8)$ — Multiply $\frac{1}{2}$ by 16.

↓

$(8)(8)$ — Multiply 8 by 8.

So, $\frac{1}{2}(4)^2(8) = 64$.

Try These

Simplify each expression by following the steps.

1. $\frac{1}{2}(6)(3)$

   First do: _____

   Then do: _____

   The value is _____.

2. $2(3.14)(14)$

   First do: _____

   Then do: _____

   The value is _____.

3. $\frac{1}{2}(8)(4 + 7)$

   First do: _____

   Then do: _____

   The value is _____.

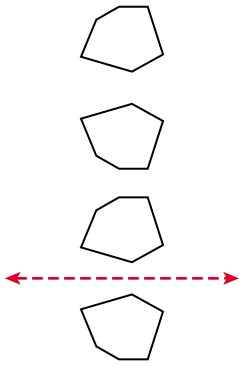
Go to the next side.

7-10 Transformations

Example 1 Identifying Transformations

Tell whether each is a translation, rotation, or reflection.

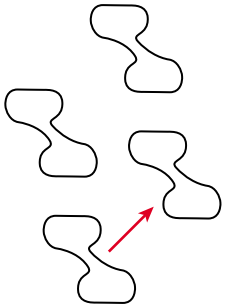
A.



The figure is flipped over a line.

It is a reflection.

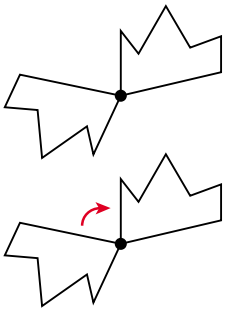
B.



The figure is moved along a line.

It is a translation.

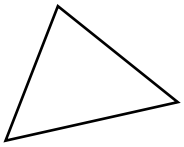
C.



The figure moves around a point.

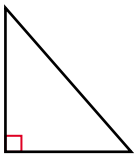
It is a rotation.

7-5 Triangles

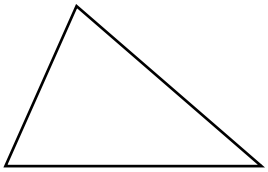


Acute triangle

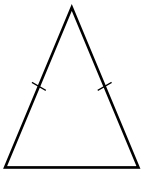
Obtuse triangle



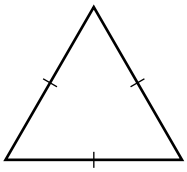
Right triangle



Scalene triangle



Isosceles triangle



Equilateral triangle