

# Grade 9 Mathematics Preparation Worksheet Booklet



The following worksheets are designed to help students practice and review key concepts and skills from previous mathematics courses that are needed for success with the new concepts introduced in high school.

## Adding and Subtracting Fractions (A)

Find the value of each expression in lowest terms.

1.  $\frac{7}{4} - \frac{8}{5}$

5.  $\frac{3}{2} - \frac{9}{7}$

9.  $\frac{4}{3} - \frac{2}{5}$

2.  $\frac{23}{2} + \frac{9}{4}$

6.  $\frac{7}{10} + \frac{2}{5}$

10.  $\frac{5}{2} + \frac{2}{3}$

3.  $\frac{8}{3} - \frac{3}{2}$

7.  $\frac{14}{5} - \frac{4}{3}$

11.  $\frac{9}{8} + \frac{5}{6}$

4.  $\frac{5}{2} - \frac{13}{12}$

8.  $\frac{17}{7} - \frac{5}{3}$

12.  $\frac{9}{7} - \frac{5}{6}$

## Adding and Subtracting Mixed Fractions (A)

Find the value of each expression in lowest terms.

1.  $2\frac{1}{5} + 1\frac{3}{4}$

5.  $1\frac{1}{2} + 2\frac{3}{5}$

9.  $3\frac{1}{2} - 1\frac{1}{2}$

2.  $3\frac{1}{2} - 2\frac{2}{3}$

6.  $3\frac{1}{2} - 2\frac{5}{9}$

10.  $5\frac{1}{2} + 5\frac{1}{4}$

3.  $3\frac{1}{2} - 3\frac{1}{2}$

7.  $2\frac{3}{4} + 1\frac{1}{5}$

11.  $1\frac{10}{11} - 1\frac{1}{3}$

4.  $5\frac{3}{4} - 5\frac{1}{4}$

8.  $3\frac{1}{4} - 2\frac{3}{8}$

12.  $1\frac{5}{12} + 3\frac{1}{3}$

## Multiplying and Dividing Fractions (A)

Find the value of each expression in lowest terms.

1.  $\frac{1}{2} \times \frac{5}{4}$

6.  $\frac{1}{4} \times \frac{5}{3}$

11.  $\frac{10}{3} \times \frac{11}{6}$

2.  $\frac{1}{6} \div \frac{8}{11}$

7.  $\frac{11}{2} \div \frac{1}{2}$

12.  $\frac{1}{2} \div \frac{1}{2}$

3.  $\frac{1}{3} \div \frac{13}{9}$

8.  $\frac{4}{3} \div \frac{11}{12}$

13.  $\frac{14}{9} \times \frac{7}{10}$

4.  $\frac{13}{4} \div \frac{1}{2}$

9.  $\frac{1}{3} \times \frac{20}{9}$

14.  $\frac{15}{8} \times \frac{7}{6}$

5.  $\frac{17}{6} \div \frac{3}{5}$

10.  $\frac{13}{7} \times \frac{14}{11}$

15.  $\frac{3}{2} \div \frac{4}{9}$

## Multiplying and Dividing Mixed Fractions (A)

Find the value of each expression in lowest terms.

1.  $3\frac{2}{7} \div 1\frac{1}{4}$

6.  $1\frac{1}{3} \times 1\frac{2}{3}$

11.  $1\frac{3}{8} \div 1\frac{1}{12}$

2.  $1\frac{2}{3} \div 3\frac{1}{3}$

7.  $1\frac{1}{3} \times 2\frac{1}{5}$

12.  $2\frac{7}{8} \div 5\frac{1}{2}$

3.  $2\frac{1}{4} \div 1\frac{1}{2}$

8.  $2\frac{1}{7} \div 2\frac{1}{2}$

13.  $3\frac{2}{3} \div 1\frac{1}{6}$

4.  $6\frac{1}{2} \div 2\frac{2}{3}$

9.  $1\frac{3}{11} \div 2\frac{1}{3}$

14.  $1\frac{3}{8} \times 3\frac{1}{3}$

5.  $2\frac{1}{10} \div 2\frac{3}{5}$

10.  $3\frac{1}{2} \div 2\frac{3}{4}$

15.  $1\frac{4}{11} \div 1\frac{1}{4}$

## Multiplying Fractions (A)

Find the value of each expression.

1.  $\frac{5}{6} \times \frac{1}{2}$

5.  $\frac{7}{9} \times \frac{1}{2}$

9.  $\frac{1}{2} \times \frac{1}{3}$

2.  $\frac{4}{9} \times \frac{2}{3}$

6.  $\frac{5}{11} \times \frac{1}{3}$

10.  $\frac{1}{8} \times \frac{1}{4}$

3.  $\frac{3}{5} \times \frac{3}{4}$

7.  $\frac{1}{3} \times \frac{5}{6}$

11.  $\frac{1}{2} \times \frac{5}{6}$

4.  $\frac{5}{6} \times \frac{1}{3}$

8.  $\frac{1}{2} \times \frac{1}{6}$

12.  $\frac{1}{3} \times \frac{4}{5}$

## Dividing Fractions (A)

Find the value of each expression in lowest terms.

1.  $\frac{1}{5} \div \frac{2}{3}$

5.  $\frac{1}{3} \div \frac{3}{4}$

9.  $\frac{4}{9} \div \frac{1}{2}$

2.  $\frac{1}{3} \div \frac{7}{10}$

6.  $\frac{2}{9} \div \frac{3}{4}$

10.  $\frac{1}{4} \div \frac{7}{9}$

3.  $\frac{1}{2} \div \frac{2}{3}$

7.  $\frac{1}{3} \div \frac{3}{4}$

11.  $\frac{3}{7} \div \frac{5}{9}$

4.  $\frac{1}{5} \div \frac{2}{7}$

8.  $\frac{1}{7} \div \frac{1}{5}$

12.  $\frac{1}{4} \div \frac{8}{9}$

## Order of Operations (A)

Perform the operations in the correct order.

1.  $2 \times 5 - 7$

6.  $5 \div (-1)^4$

11.  $8 \div 2 - (-3)$

2.  $9 \times (3 + (-1))$

7.  $(-1)^{(-2) \times (-8)}$

12.  $4 \times (-1)^2$

3.  $-8 - 5 + (-5)$

8.  $-10 - 2 \div (-2)$

13.  $9 + 2 - (-5)$

4.  $-3 + 6 + (-9)$

9.  $-4 + (-9) \div (-1)$

14.  $1 \times 1 + (-9)$

5.  $(-5) \times (-1) - (-1)$

10.  $(7 + (-4)) \div (-3)$

15.  $-1 - (-9 + (-3))$



## Order of Operations (A)

Perform the operations in the correct order.

1.  $(10 \div 2 - 3)^2$

6.  $4 + 10 - (5 + 7)$

11.  $(6 - 4)^{6-4}$

2.  $9 + (6 \div 6)^9$

7.  $8 \times (8 - 8) \div 9$

12.  $3^2 + 4 \div 2$

3.  $(5 - 8 \div 8) \times 4$

8.  $5 + 6 - (8 - 6)$

13.  $2^{9 \div (8-5)}$

4.  $5 \times (6 \div 6)^3$

9.  $6 \div 1^{3 \div 1}$

14.  $1^{6-3 \div 3}$

5.  $(2 \div 2 \times 4)^2$

10.  $2^{8-6} + 9$

15.  $4^{2 \div 1} + 2$

## Multiplying a Monomial by a Binomial (A)

Simplify each expression.

1.  $-3n^3(-8n^3 - 3n^2)$

2.  $9a^5(-8a^4 + 2a^3)$

3.  $9h^4(-9h - 9)$

4.  $4b(9b^5 + 7b^4)$

5.  $-8v^3(3v^5 + 3v^4)$

6.  $-2a^2(-8a^2 + 9a)$

7.  $7a^3(-3a^4 + 6a^3)$

8.  $-6p(2p^3 - 4p^2)$

9.  $-2p^3(-4p^4 - 7p^3)$

10.  $3x^3(-2x^5 + 9x^4)$

Name : \_\_\_\_\_

Score : \_\_\_\_\_

# Order of Operations

Solve.

1)  $(8 + (2^4 + 3)) \div 9$

Ans =

2)  $((7 - 11) + 15) \times 4^2$

Ans =

3)  $((99 - 1) \div 7^2) \times 2 + 8$

Ans =

4)  $5^3 \times ((18 \div 3) - 5)$

Ans =

5)  $28 \div (4 - (3^2 \times 2))$

Ans =

6)  $70 \div ((8 - 9) - 13) \times 2^5$

Ans =

7)  $((2 + 8^2) - 6) \div 10$

Ans =

8)  $4^2 \times ((2 + 3) - 11)$

Ans =

9)  $5 + (2 \times (5^3 + 3)) - 84$

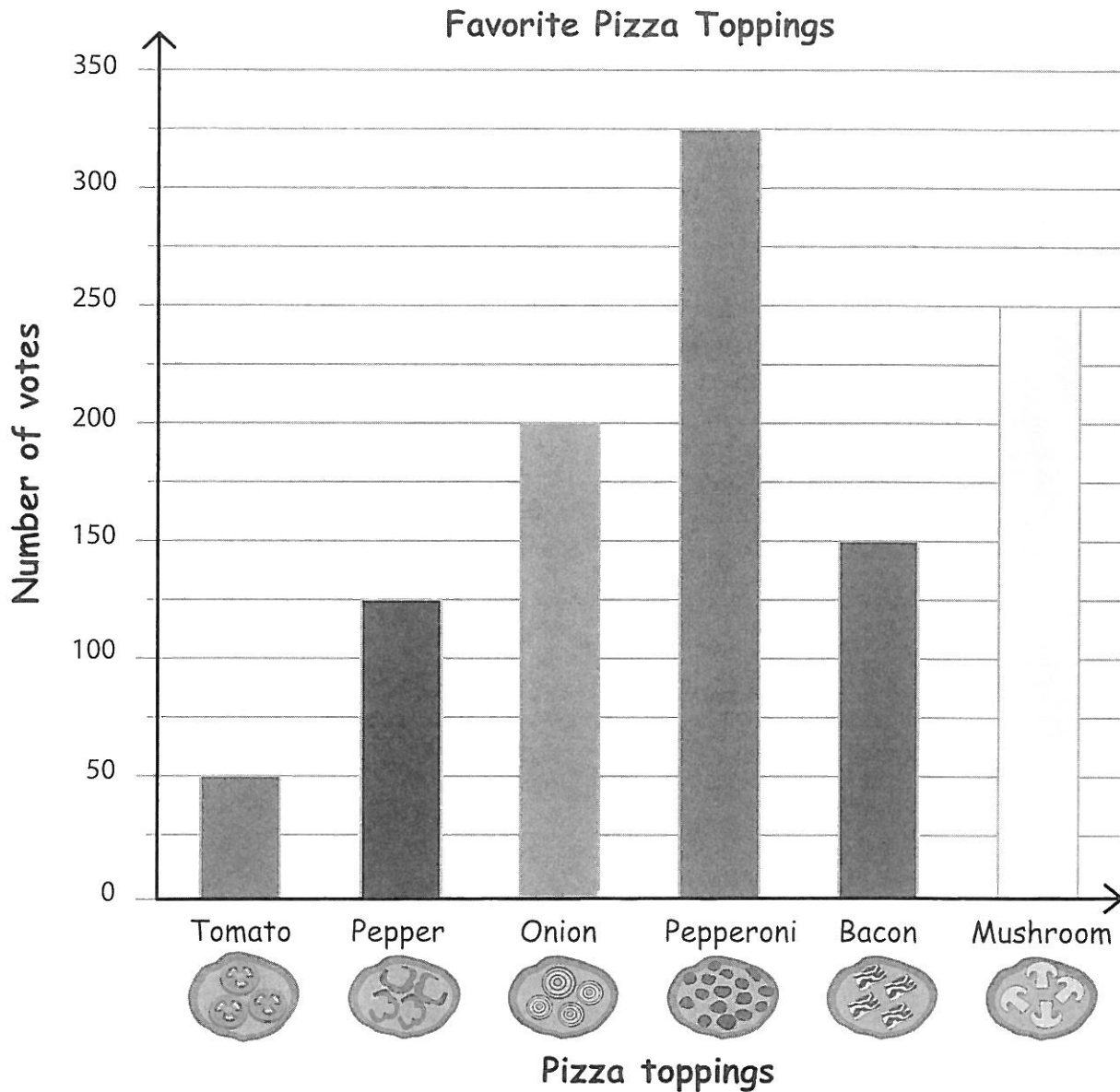
Ans =

10)  $((2 \times 6) + 60) \div 6^2$

Ans =

# Bar Graph - Pizza Toppings

Good Time Pizza Makers are best in making pizzas with six different toppings. They took a survey about customers' favorite toppings and recorded the results in a bar graph. Use the bar graph to answer the questions.



- Which is the most popular topping?  
\_\_\_\_\_
- How many customers have chosen either tomato or pepper toppings?  
\_\_\_\_\_
- If 75 more customers prefer bacon, which one will top the chart, bacon or onion?  
\_\_\_\_\_
- Which topping has 250 votes?  
\_\_\_\_\_
- List the toppings in order from most popular to least popular.  
\_\_\_\_\_

## Scatter Plots and Line of Best Fit Worksheet

Analyse the following table and do the following questions

Year	Population (in thousands)
1970	55
1980	40
1990	50
2000	25
2001	65
2002	60
2003	75

1. Sketch a scatter plot of the table above.
2. Draw the line of best fit.
3. Conclude if it's a positive correlation or negative correlation.

\*(**HINT**: Positive correlation is increasing and negative correlation is decreasing)\*

SHOW ALL WORK UNDER THE LISTED QUESTIONS.

## Rates Worksheet

1. Calculate each unit rate.

a) A printer prints 34 pages in 4 minutes.

b) Dog food costs \$16 for a 4-kg bag.

c) A car travelled 1250 km in 15 hours.

d) A breakfast cereal costs \$3.50 for 650 g.

e) A recipe calls for 750 mL of flour to make 30 carrot muffins.

## Simplifying Expressions (A)

Simplify each expression.

1.  $2x^2 - 10x^2 + 9x$

6.  $-1 + 1 - c^2$

2.  $7a^2 + 8a + 9a^2$

7.  $2 + 8z^2 + 1$

3.  $5 \cdot 5x^2 \cdot (-5x)$

8.  $x^2 - x - x$

4.  $-1 - a^2 - 4a^2$

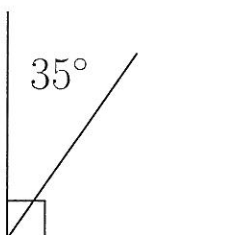
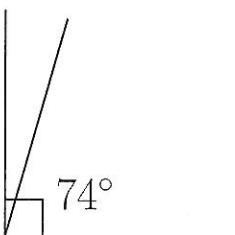
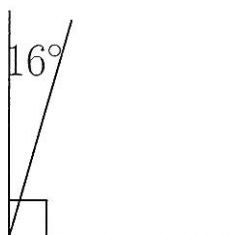
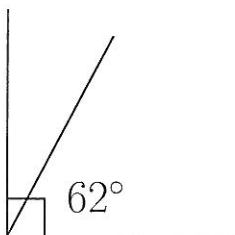
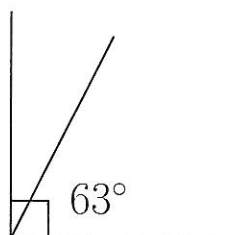
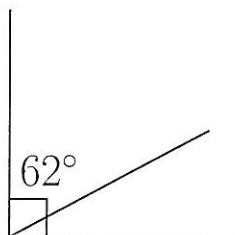
9.  $-\frac{u^2}{-u^2} \cdot (-u^2)$

5.  $-x^2 - 1 - 5x^2$

10.  $-a \cdot \frac{7a^2}{a}$

## Complementary Angles (A)

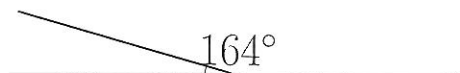
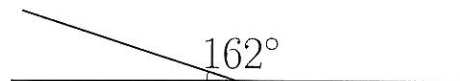
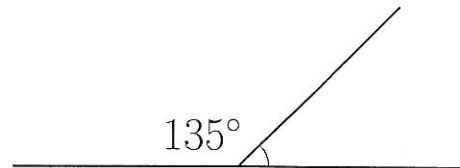
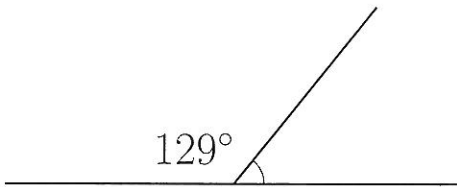
Find the complementary angle measurement for each measured angle.





## Supplementary Angles (A)

Find the supplementary angle measurement for each measured angle.



# Percent Calculations (A)

Calculate the percent or value requested.

1. What percent of 642 is 321?

2. What percent of 520 is 78?

3. What percent of 270 is 27?

4. What percent of 260 is 195?

5. What percent of 718 is 359?

6. What percent of 921 is 307?

7. What percent of 412 is 103?

8. What percent of 908 is 227?

9. What percent of 232 is 174?

10. What percent of 960 is 192?

# Percent Calculations (A)

Calculate the percent or value requested.

1. What percent of 200 is 28?

2. What percent of 950 is 931?

3. What percent of 700 is 364?

4. What percent of 100 is 13?

5. What percent of 700 is 273?

6. What percent of 575 is 161?

7. What percent of 1,000 is 200?

8. What percent of 300 is 111?

9. What percent of 400 is 68?

10. What percent of 500 is 95?

## Linear Relations Worksheet

1. John makes house calls to repair home computers. The following is a partial list of his repair charges.

Labour(hours)	Repair costs(\$)
1	120
2	160
3	200

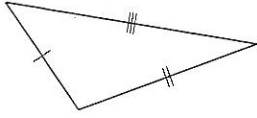
- a) Graph the relation.

- b) What is the repair cost for a 6 hour job?

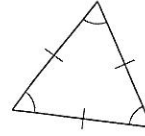
- c) Identify the coordinates of the point where the graph crosses the vertical axis (or y-axis). Explain the significance of this point.

# Classifying Triangles (A)

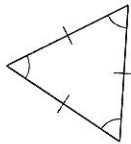
Classify each triangle using its side properties.



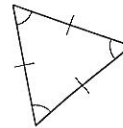
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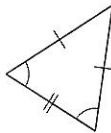
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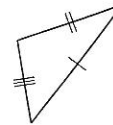
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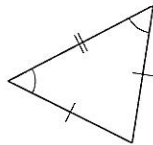
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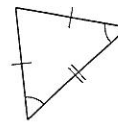
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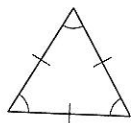
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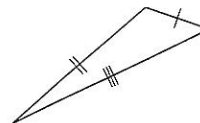
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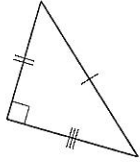
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# Classifying Triangles (A)

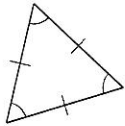
Classify each triangle using its side and angle properties.



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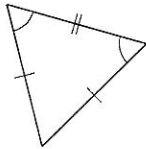
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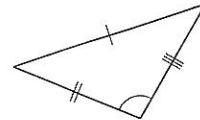
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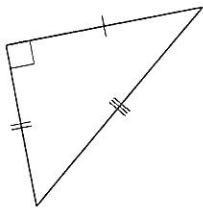
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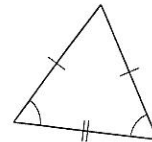
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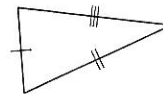
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# Classifying Quadrilaterals (A)

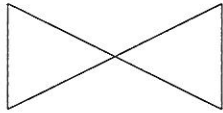
Identify each quadrilateral.



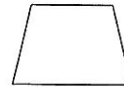
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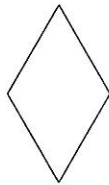
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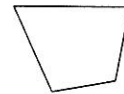
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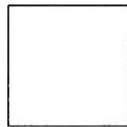
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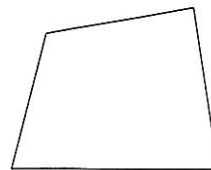
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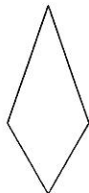
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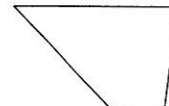
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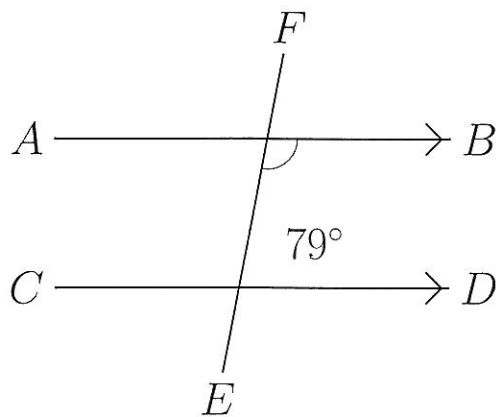
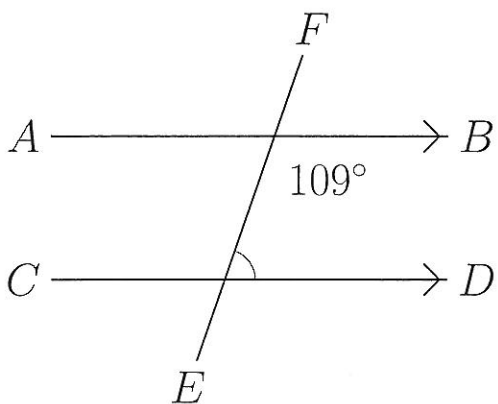
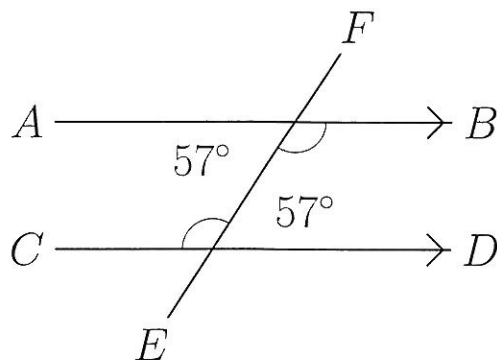
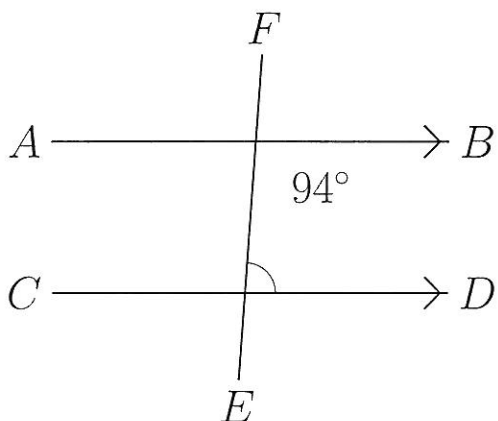
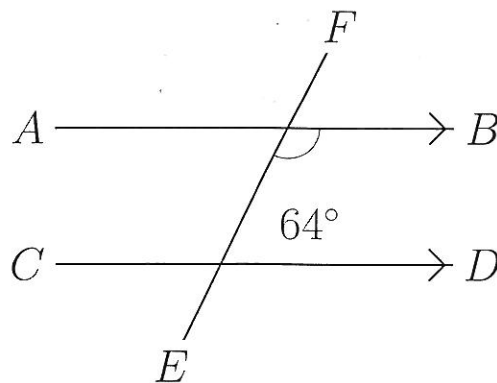
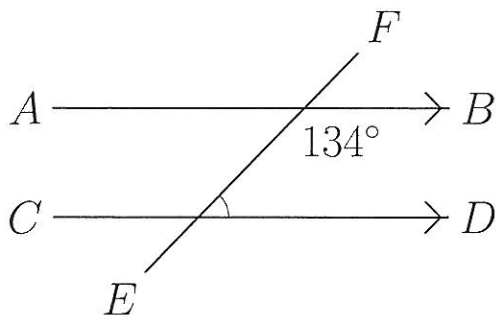
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## Co-Interior Angles (A)

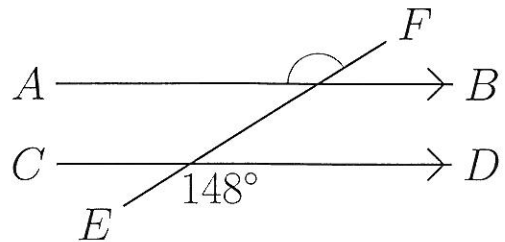
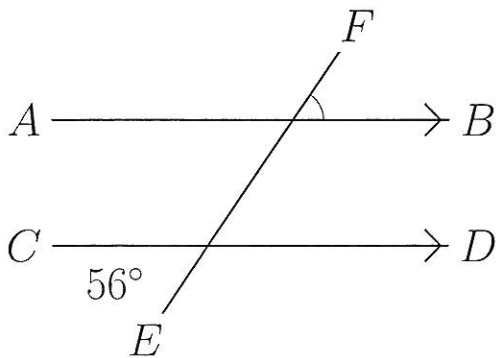
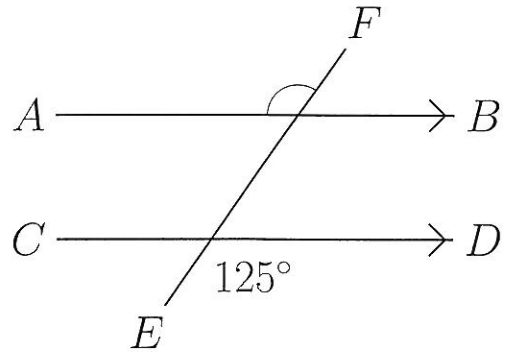
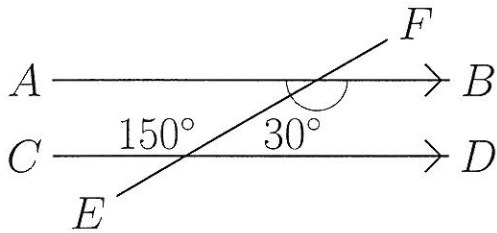
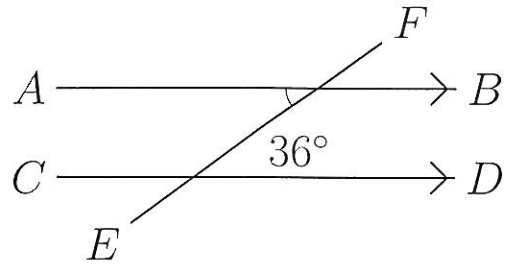
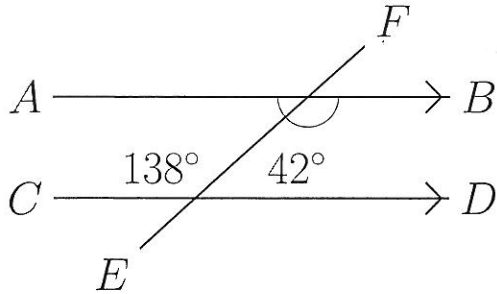
Find the co-interior angle measurements for the measured angles.





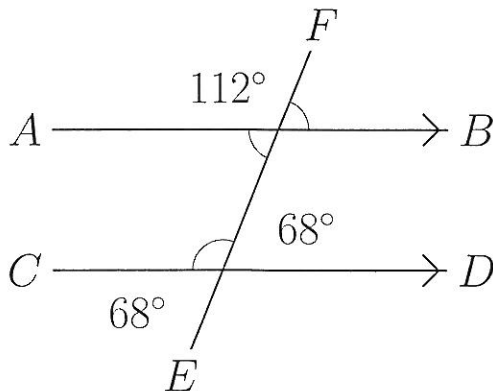
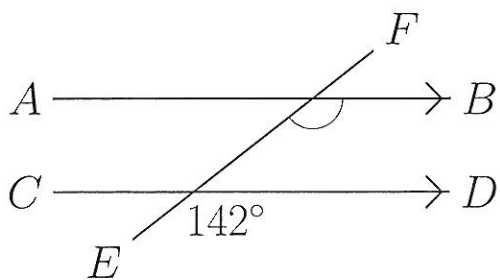
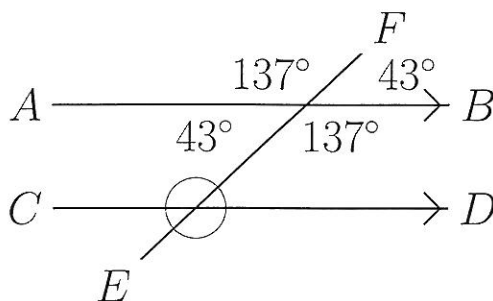
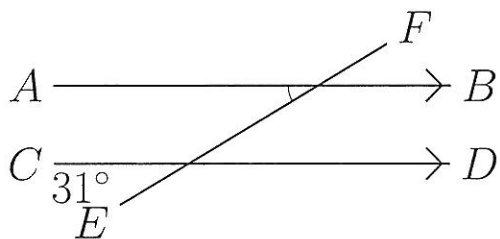
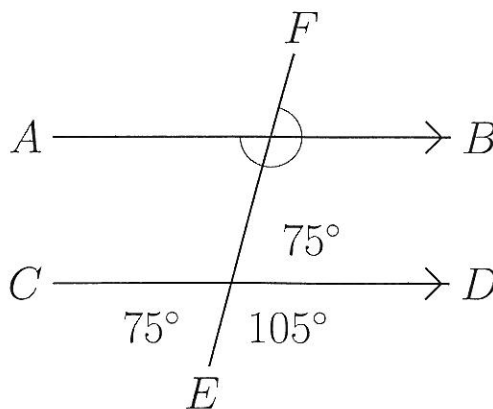
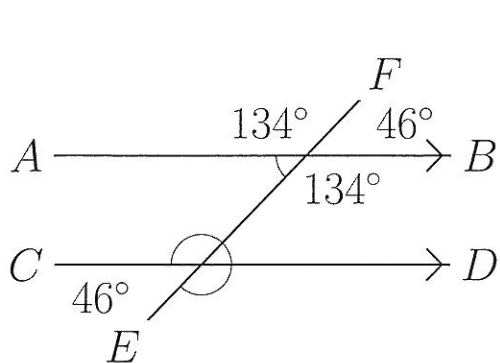
# Alternate Angles (A)

Find the alternate angle measurements for the measured angles.



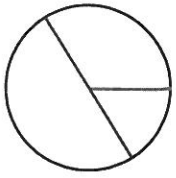
## Corresponding Angles (A)

Find the corresponding angle measurements for the measured angles.

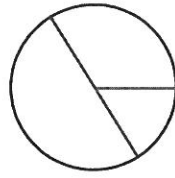


# Circumference and Area of Circles (A)

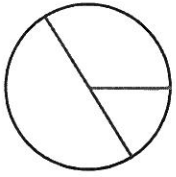
Find the circumference and area of each circle to one decimal place.



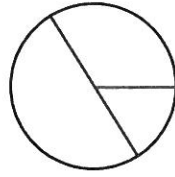
$d = 7.9 \text{ cm}$



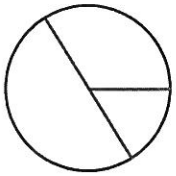
$d = 6.3 \text{ cm}$



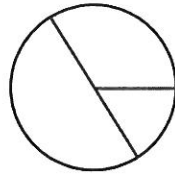
$r = 7.3 \text{ cm}$



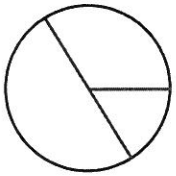
$d = 5.5 \text{ cm}$



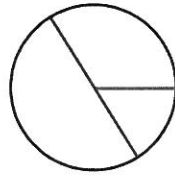
$d = 9.5 \text{ mm}$



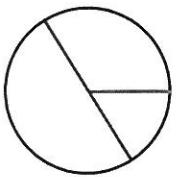
$r = 1 \text{ yd}$



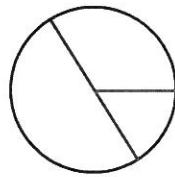
$r = 9.7 \text{ m}$



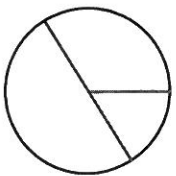
$d = 7 \text{ m}$



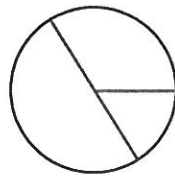
$r = 0.5 \text{ m}$



$r = 2.4 \text{ cm}$



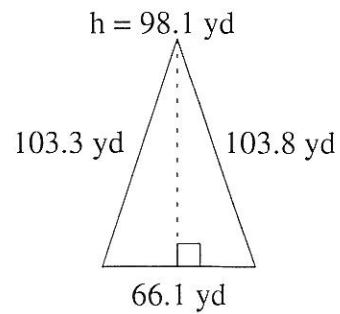
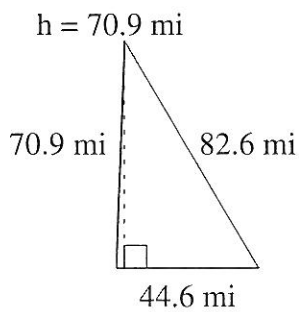
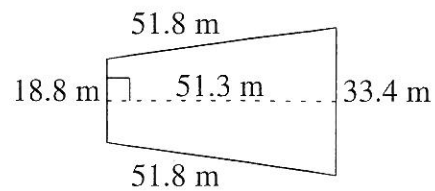
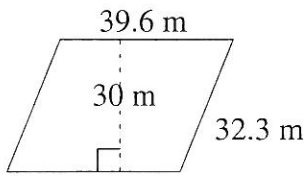
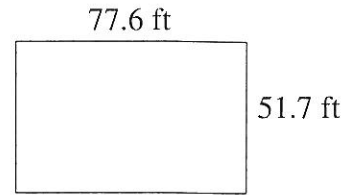
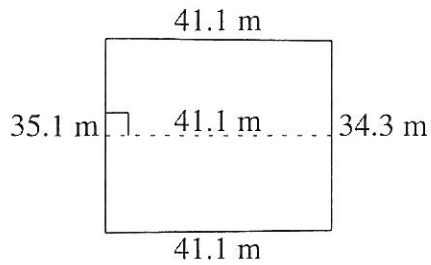
$d = 0.9 \text{ mi}$



$r = 8 \text{ in}$

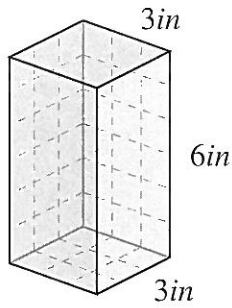
# Area and Perimeter of Various Shapes (A)

Find the area and perimeter of each shape.



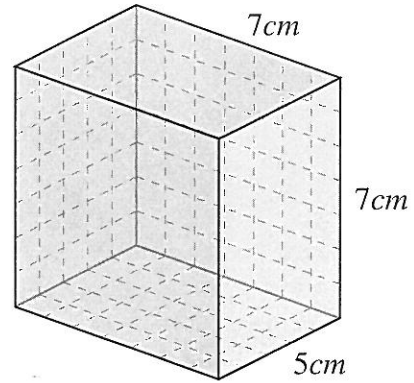
# Volume and surface area of prisms (A)

Find the volume and surface area of each prism.



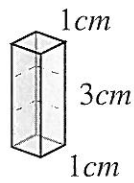
V: \_\_\_\_\_

SA: \_\_\_\_\_



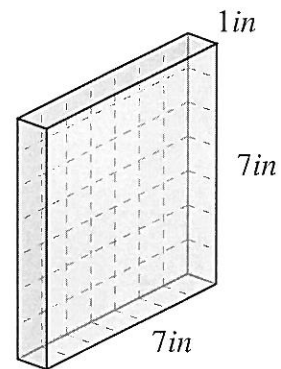
V: \_\_\_\_\_

SA: \_\_\_\_\_



V: \_\_\_\_\_

SA: \_\_\_\_\_



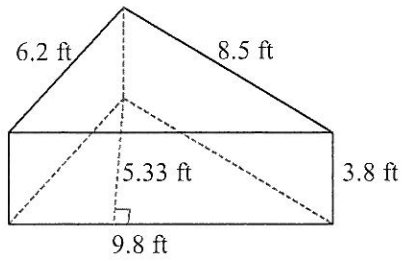
V: \_\_\_\_\_

SA: \_\_\_\_\_

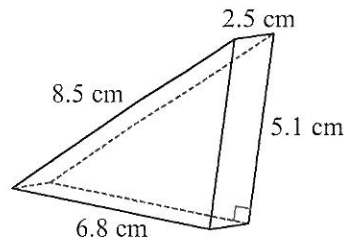
## Volume and Surface Area of Triangular Prisms (A)

Instructions: Find the volume and surface area for each triangular prism.

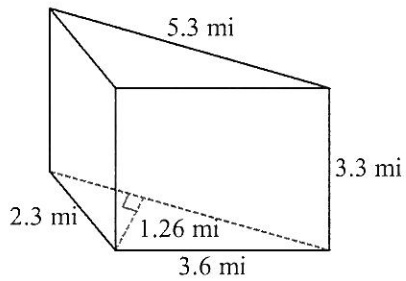
1)



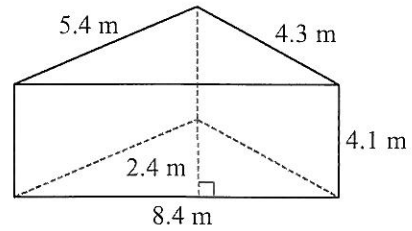
2)



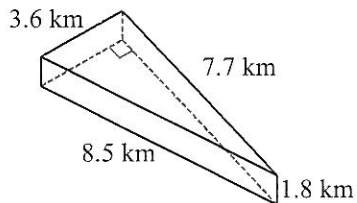
3)



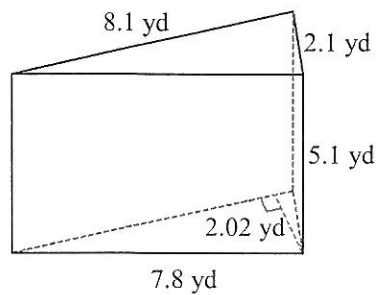
4)



5)



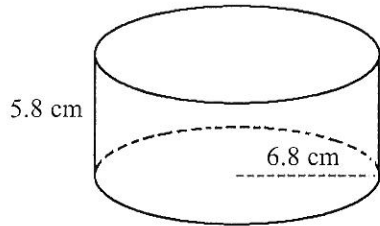
6)



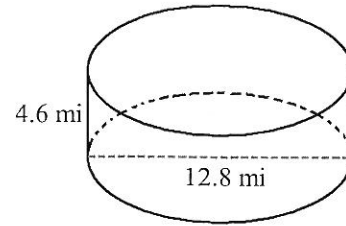
## Volume and Surface Area of Cylinders (A)

Instructions: Find the volume and surface area for each cylinder.

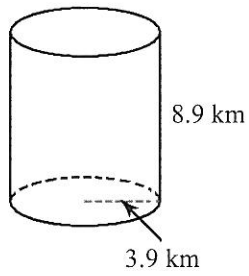
1)



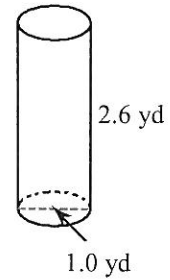
2)



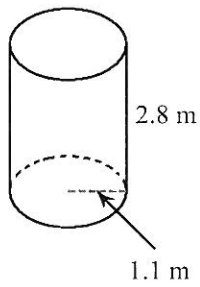
3)



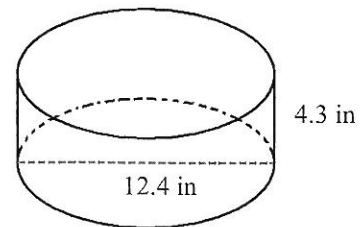
4)



5)



6)



## Unit Conversions

1 a. 10 974 m = \_\_\_\_\_ km

1 b. 0.5 km = \_\_\_\_\_ m

2 a. 859 ml = \_\_\_\_\_ L

2 b. 4 mm = \_\_\_\_\_ cm

3 a. 692 cm = \_\_\_\_\_ m

3 b. 1.2 kg = \_\_\_\_\_ g

4 a. 55 cm = \_\_\_\_\_ m

4 b. 2.6 cm = \_\_\_\_\_ mm

5 a. 9 cm = \_\_\_\_\_ m

5 b. 1 714 ml = \_\_\_\_\_ L

6 a. 1 418 m = \_\_\_\_\_ km

6 b. 679 mm = \_\_\_\_\_ cm

7 a. 17 045 ml = \_\_\_\_\_ L

7 b. 1 238 m = \_\_\_\_\_ km

8 a. 226 mm = \_\_\_\_\_ cm

8 b. 7.5 kg = \_\_\_\_\_ g

9 a. 3.1 cm = \_\_\_\_\_ mm

9 b. 0.9 m = \_\_\_\_\_ cm

10 a. 857 cm = \_\_\_\_\_ m

10 b. 22 mm = \_\_\_\_\_ cm

11 a. 1 964 ml = \_\_\_\_\_ L

11 b. 27.1 cm = \_\_\_\_\_ mm

12 a. 14 846 m = \_\_\_\_\_ km

12 b. 1 447 ml = \_\_\_\_\_ L



# Scientific Notation (A)

Convert each ordinary number to scientific notation.

$$3,900 = \qquad \qquad \qquad 0.000000038 =$$

$$0.0094 = \qquad \qquad \qquad 0.0000032 =$$

$$0.00945 = \qquad \qquad \qquad 61,490,000 =$$

$$9,400 = \qquad \qquad \qquad 181,000,000 =$$

$$1,060,000 = \qquad \qquad \qquad 5,800,000 =$$

$$5,729 = \qquad \qquad \qquad 7,907,000 =$$

$$74,920 = \qquad \qquad \qquad 63,000 =$$

$$0.0008 = \qquad \qquad \qquad 0.0000028 =$$

$$0.00064 = \qquad \qquad \qquad 317,300,000 =$$

$$0.000000026 = \qquad \qquad \qquad 0.000054 =$$

## Rearranging Important Formulas for Grade 9 Math & Science

Rearrange to get each of following variables by itself in each of the formulas below:

1.  $m$  then  $v$

$$D = v/m$$

2.  $v$  then  $I$

$$R = v/I$$

3.  $d$  then  $t$

$$S = d/t$$

4.  $m$ ,  $x$  and  $b$

$$y = mx + b$$