



Complete Review Answer Key for Unit 1, 2, and 3

Answer
Key

Rational and Irrational Numbers
Identify whether the numbers below can be represented as fractions. Rational numbers can; irrational numbers cannot. Express each of the numbers below as a fraction if you can. Label the numbers as rational or irrational.

1) π _____ IRRATIONAL _____

2) 5 _____ $5/1$ RATIONAL _____

3) $\sqrt{99}$ _____ IRRATIONAL _____

4) $\sqrt{3}$ _____ IRRATIONAL _____

5) $\sqrt{100}$ _____ $10/1$ RATIONAL _____

6) $.333\bar{3}$ _____ $1/3$ RATIONAL _____

7) $14/3$ _____ IRRATIONAL _____

8) 1.5 _____ $3/2$ RATIONAL _____

9) $.11\bar{1}$ _____ $1/9$ RATIONAL _____


10) $\sqrt{2}$ _____ IRRATIONAL _____

11) $\sqrt{9}$ _____ $3/1$ RATIONAL _____

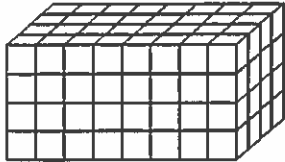
12) $\sqrt{-5}$ _____ IRRATIONAL _____

Answer Key

Count the cubes and find the volume of each rectangular prism.

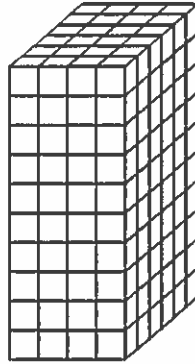
 = 1 cm³

1)



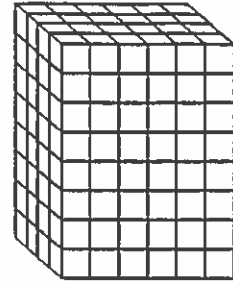
Volume = 128 cm³

2)



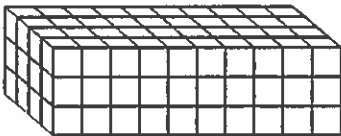
Volume = 240 cm³

3)



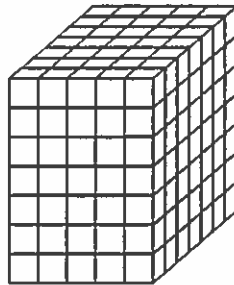
Volume = 192 cm³

4)



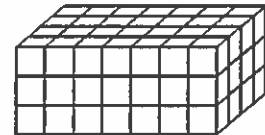
Volume = 150 cm³

5)



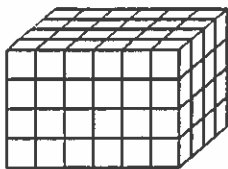
Volume = 245 cm³

6)



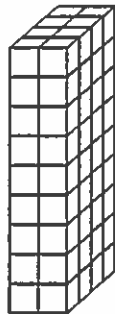
Volume = 84 cm³

7)



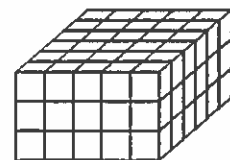
Volume = 64 cm³

8)



90 cm³

9)



Volume = 60 cm³

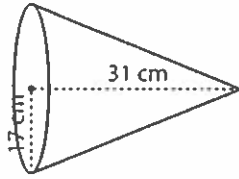
Name : _____

Score : _____

Answer Key

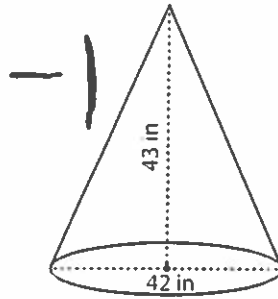
Find the volume of each cone. Round the answer to nearest tenth. (use $\pi = 3.14$)

1)



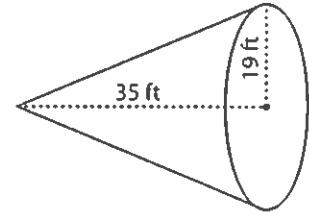
Volume = 3377.1 cm³

2)



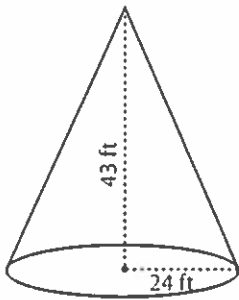
Volume = 19847.9 in³

3)



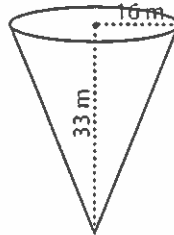
Volume = 13224.6 ft³

4)



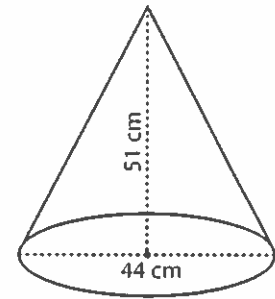
Volume = 25923.8 ft³

5)



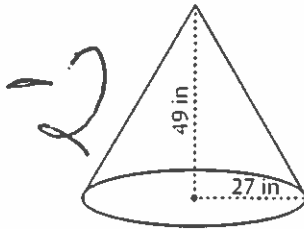
Volume = 8842.2 m³

6)



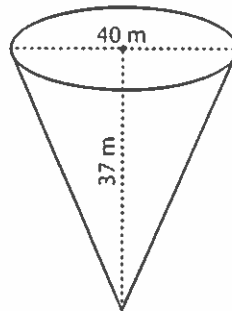
Volume = 25835.9 cm³

7)



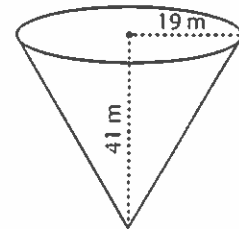
Volume = 37388 in³

8)



Volume = 15490.7 m³

9)



Volume = 15491.7 m³

10) A conical flask has a diameter of 20 centimeter and a height of 18 centimeter. Find the volume of air it can occupy.

Volume = 1334 cm³

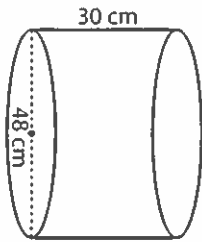
Name : _____

Score : _____

Answer Key

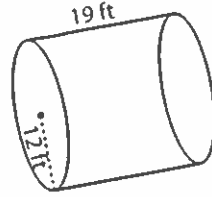
Find the volume of each cylinder. (use $\pi = 3.14$)

1)



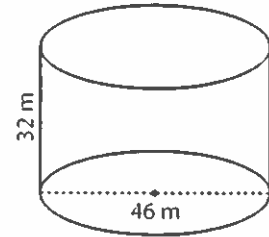
Volume = 54259.2 cm³

2)



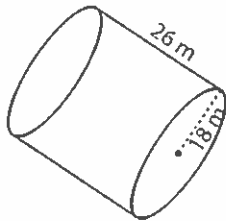
Volume = 8591.04 ft³

3)



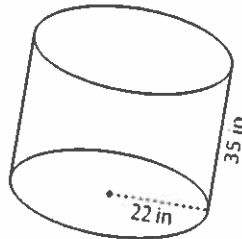
Volume = 53153.92 m³

4)



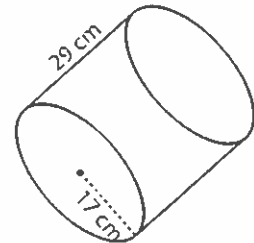
Volume = 26451.36 m³

5)



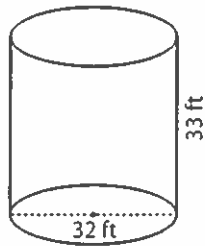
Volume = 53191.6 in³

6)



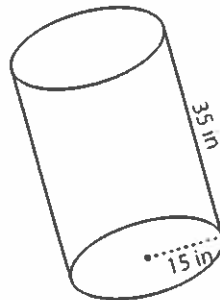
Volume = 26316.34 cm³

7)



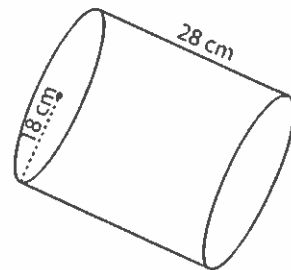
Volume = 26526.72 ft³

8)



Volume = 21727.5 in³

9)



Volume = 23486.08 cm³

10) A cylindrical container has a radius of 25 inches and a height of 31 inches. What is the volume of the container?

Volume = 30837.5 in³

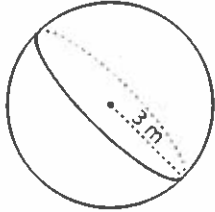
Name : _____

Score : _____

Answer Key

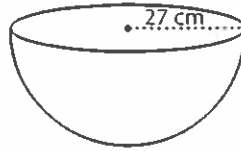
Find the exact volume of each shape.

1)



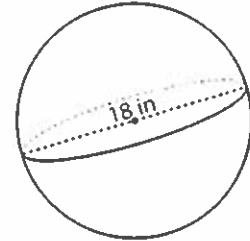
Volume = $36\pi \text{ m}^3$

2)



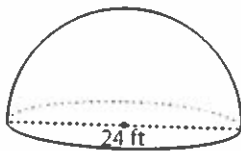
Volume = $13122\pi \text{ cm}^3$

3)



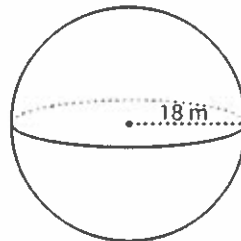
Volume = $972\pi \text{ in}^3$

4)



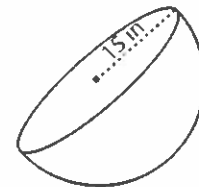
Volume = $1152\pi \text{ ft}^3$

5)



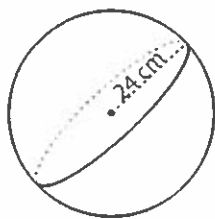
Volume = $7776\pi \text{ m}^3$

6)



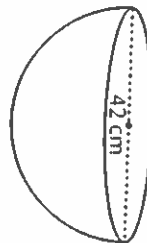
Volume = $2250\pi \text{ in}^3$

7)



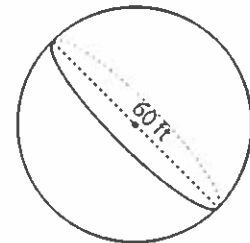
Volume = $18132\pi \text{ cm}^3$

8)



Volume = $5174\pi \text{ cm}^3$

9)



Volume = $36000\pi \text{ ft}^3$

10) A spherical ball has a radius of 6 centimeter. Calculate the volume of the ball.

Volume = $288\pi \text{ cm}^3$

Student Name: _____

Score: _____

Answers

$$2\sqrt{3} + 2\sqrt{3} - 3\sqrt{3} = \sqrt{3}$$

$$7\sqrt{2} + 5\sqrt{2} - 6\sqrt{2} = 6\sqrt{2}$$

$$8\sqrt{17} - \sqrt{17} + 6\sqrt{17} = 13\sqrt{17}$$

$$11\sqrt{3} - 2\sqrt{11} + 5\sqrt{11} = 11\sqrt{11}$$

$$5\sqrt{5} + 4\sqrt{5} - 3\sqrt{5} = 6\sqrt{5}$$

$$8\sqrt{2} + 4\sqrt{2} - 3\sqrt{2} = 9\sqrt{2}$$

$$9\sqrt{11} - 8\sqrt{11} + \sqrt{11} = 2\sqrt{11}$$

$$5\sqrt{3} - 5\sqrt{3} + 4\sqrt{2} = 4\sqrt{2}$$

$$6\sqrt{5} - 2\sqrt{3} + 2\sqrt{5} = 8\sqrt{5} - 2\sqrt{3}$$

Student Name: _____

Score: _____

Answers

~~$\frac{7}{5}$~~

Answer: $\frac{1}{a^{15}}$

$$\frac{(a^5 a^9)^{-5}}{a^{-15}}$$

Answer: $\frac{1}{m^{10}}$

$$\left(\frac{m^{-3} m^{-7}}{(m^{-4})^{-3}} \right)^5$$

Answer: $\frac{1}{z^{11}}$

$$\left(\frac{z^{-4}}{z^6} \times \frac{z^5}{z^{-6}} \right)^{-11}$$

Answer: $\frac{1}{d^{14}}$

$$\frac{(d^4)^{-3}}{(d^6)^{-2}} \div \left(\frac{d^4}{d^6} \right)^{-8}$$

Answer: $\frac{1}{d^{14}}$

Student Name: _____

Score: _____

Answers

$\frac{x^7 x^4}{x^5}$	
Answer: x^6	
$\frac{(a^5 a^9)^{-5}}{a^{-15}}$	
Answer: $\frac{1}{a^{15}}$	
$\left(\frac{m^{-3} m^{-7}}{(m^{-4})^{-3}}\right)^5$	
Answer: $\frac{1}{m^{10}}$	
$\left(\frac{z^{-4}}{z^6} \times \frac{z^5}{z^{-6}}\right)^{-11}$	
Answer: $\frac{1}{z^{11}}$	
$\frac{(d^4)^{-3}}{(d^6)^{-2}} \div \left(\frac{d^4}{d^6}\right)^{-8}$	
Answer: $\frac{1}{d^{10}}$	

Answer key**Example:**

Write 324170 in scientific notation.



3 2 4 1 7 0.

We should move the decimal point 5 places to the left. So, the exponent will be 5.

$$324,170 = 3.2417 \times 10^5$$

Express each number in scientific notation.

1) 2,343,600 = 2.3436 × 10⁶

2) 512,420,000 = 5.1242 × 10⁸

3) 4,600,000,000,000 = 4.6 × 10¹²

4) 725,000,000 = 7.25 × 10⁸

5) 120,000,000,000,000 = 1.2 × 10¹⁴

6) 100,180,000,000 = 1.0018 × 10¹¹

7) 81,000,000 = 8.1 × 10⁷

8) 14,752,000,000 = 1.4752 × 10¹⁰

9) 29,540,000,000,000 = 2.954 × 10¹³

10) 6,241,000,000 = 6.241 × 10⁹

Answer key**Example:**

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8) 14,752,000,000 = 1.4752 × 10¹⁰

9) 29,540,000,000,000 = 2.954 × 10¹³

10) 6,241,000,000 = 6.241 × 10⁹

Answer key

Example: 1

Write 514, 223 in scientific notation.

We should move the decimal point 5 places to the left. So, the exponent will be 5.

$$514,223 = 5.14223 \times 10^5$$

Example: 2

Write 0.0000083 in scientific notation.

We should move the decimal point 6 places to the right. So, the exponent will be -6.

$$0.0000083 = 8.3 \times 10^{-6}$$

Express each number in scientific notation.

1) 18,451,000 = 1.8451 × 10⁷

2) 0.000004826 = 4.826 × 10⁻⁶

3) 5,820,000,000,000 = 5.82 × 10¹²

4) 0.000000007269 = 7.269 × 10⁻⁹

5) 350,100,000,000,000 = 3.501 × 10¹⁴

6) 0.00000000000014 = 1.4 × 10⁻¹³

7) 71,300,000 = 7.13 × 10⁷

8) 0.00000002164 = 2.164 × 10⁻⁸

9) 30,000,000,000,000 = 3 × 10¹³

10) 0.0000642 = 6.42 × 10⁻⁵

Answer key**Example:**

Write 5.21236×10^5 in standard notation.

Here the exponent is 5. We should move the decimal point 5 places to the right.

5.2 1 2 3 6

$$5.21236 \times 10^5 = 521,236$$

Express each number in standard notation.

1) 3.6212×10^8 = 362,120,000

2) 1.345×10^5 = 134,500

3) 4.62×10^{10} = 46,200,000,000

4) 7.2×10^7 = 72,000,000

5) 2.853×10^{12} = 2,853,000,000,000

6) 8.5925×10^9 = 8,592,500,000

7) 1.24×10^5 = 124,000

8) 5.019×10^8 = 501,900,000

9) 62.025×10^{11} = 6,202,500,000,000

10) 2.4×10^6 = 2,400,000

Answer key

Example: 1

Write 4.32215×10^5 in standard notation.

Here the exponent is 5. We should move the decimal point 5 places to the right.



$$4.32215 \times 10^5 = 432,215$$

Example: 2

Write 3.7×10^{-6} in standard notation.

Here the exponent is -6. We should move the decimal point 6 places to the left.



$$3.7 \times 10^{-6} = 0.0000037$$

Express each number in standard notation.

1) $4.62 \times 10^8 = \underline{462,000,000}$

2) $1.2561 \times 10^{-5} = \underline{0.000012561}$

3) $9.082 \times 10^{11} = \underline{908,200,000,000}$

4) $5.4 \times 10^{-7} = \underline{0.00000054}$

5) $3.5624 \times 10^{13} = \underline{35,624,000,000,000}$

6) $7.5005 \times 10^{-12} = \underline{0.0000000000075005}$

7) $1.28 \times 10^8 = \underline{128,000,000}$

8) $2.119 \times 10^{-10} = \underline{0.0000000002119}$

9) $8.0025 \times 10^6 = \underline{8,002,500}$

10) $3.1 \times 10^{-9} = \underline{0.0000000031}$

Answer key

Example:

Write 0.00000285 in scientific notation.

We should move the decimal point 6 places to the right. So, the exponent will be -6.

$$\begin{array}{cccccccc}
 0 & . & 0 & 0 & 0 & 0 & 0 & 2 & 8 & 5 \\
 \updownarrow & & \updownarrow & \updownarrow & \updownarrow & \updownarrow & \updownarrow & \updownarrow & & \\
 0 & . & 0 & 0 & 0 & 0 & 0 & 2 & 8 & 5 \\
 \end{array}$$

$0.00000285 = 2.85 \times 10^{-6}$

Express each number in scientific notation.

1) $0.0000261 = \underline{2.61 \times 10^{-5}}$

2) $0.0000005724 = \underline{5.724 \times 10^{-7}}$

3) $0.00000312 = \underline{3.12 \times 10^{-6}}$

4) $0.00000000100 = \underline{1 \times 10^{-9}}$

5) $0.000000000000059 = \underline{5.9 \times 10^{-14}}$

6) $0.0000000007 = \underline{7 \times 10^{-10}}$

7) $0.0000000088 = \underline{8.8 \times 10^{-9}}$

8) $0.00000020 = \underline{2 \times 10^{-7}}$

9) $0.000000000000176 = \underline{1.76 \times 10^{-13}}$

10) $0.000002905 = \underline{2.905 \times 10^{-6}}$

Answer key

Example: 1

Write 514, 223 in scientific notation.

We should move the decimal point 5 places to the left. So, the exponent will be 5.

$$514,223 = 5.14223 \times 10^5$$

Example: 2

Write 0.0000083 in scientific notation.

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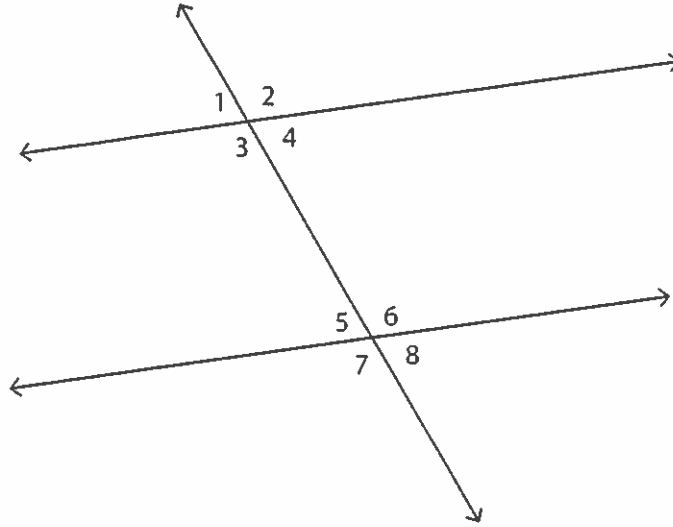
8) 0.00000002164 = 2.164 × 10⁻⁸

9) 30,000,000,000,000 = 3 × 10¹³

10) 0.0000642 = 6.42 × 10⁻⁵

Answer Key

Write the angle relationship for each pair of angles.

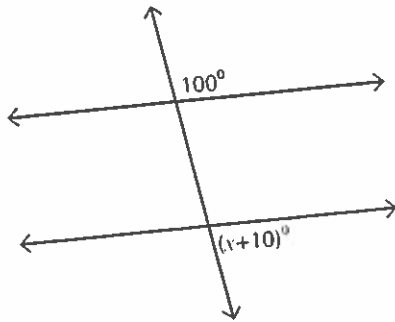


- 1) $\angle 1$ and $\angle 4$ are vertical angles
- 2) $\angle 2$ and $\angle 7$ are alternate exterior angles
- 3) $\angle 4$ and $\angle 8$ are corresponding angles
- 4) $\angle 3$ and $\angle 5$ are same side interior angles
- 5) $\angle 6$ and $\angle 8$ are linear pair
- 6) $\angle 1$ and $\angle 7$ are same side exterior angles
- 7) $\angle 3$ and $\angle 6$ are alternate interior angles
- 8) $\angle 1$ and $\angle 3$ are linear pair
- 9) $\angle 2$ and $\angle 6$ are corresponding angles
- 10) $\angle 6$ and $\angle 7$ are vertical angles

Answer Key

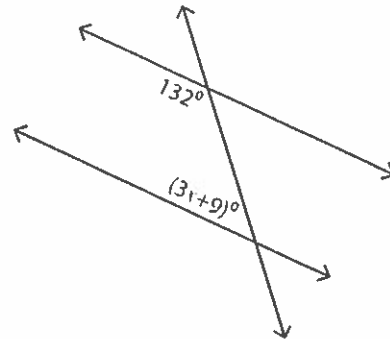
Find the value of x .

1)



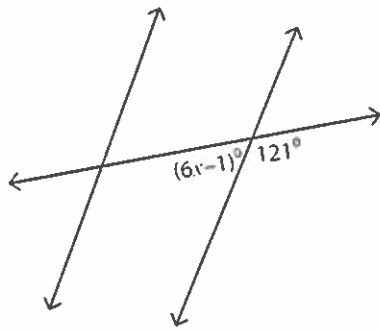
$$x = \underline{70}$$

2)



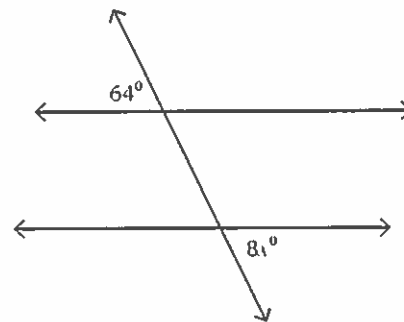
$$x = \underline{13}$$

3)



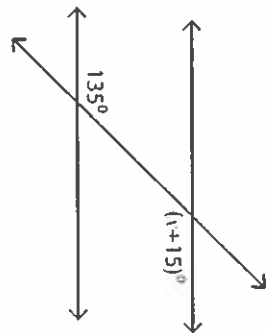
$$x = \underline{10}$$

4)



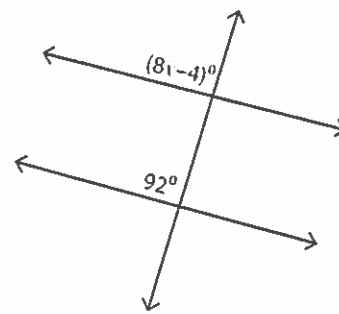
$$x = \underline{8}$$

5)



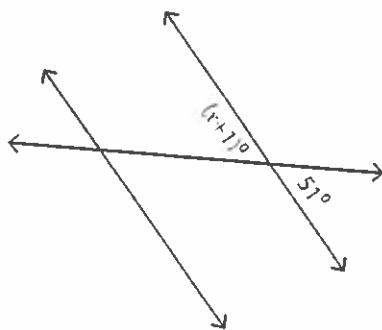
$$x = \underline{120}$$

6)



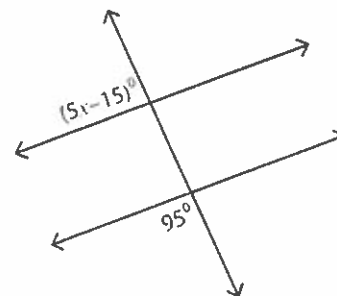
$$x = \underline{12}$$

7)



$$x = \underline{50}$$

8)



$$x = \underline{30}$$

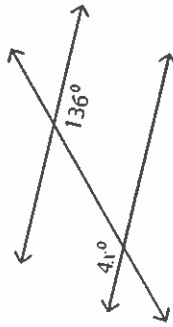
Name : _____

Score : _____

Answer Key

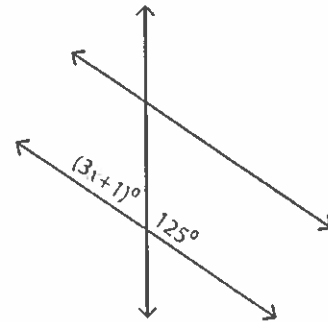
Find the value of x .

1)



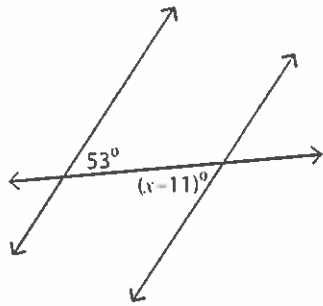
$x = \underline{34}$

2)



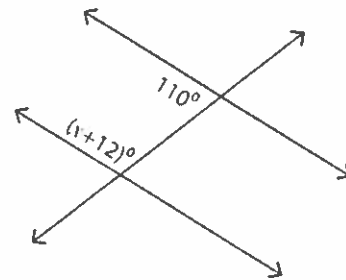
$x = \underline{18}$

3)



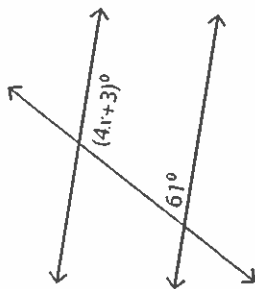
$x = \underline{54}$

4)



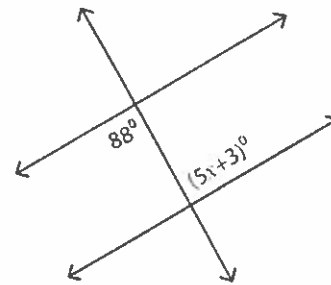
$x = \underline{53}$

5)



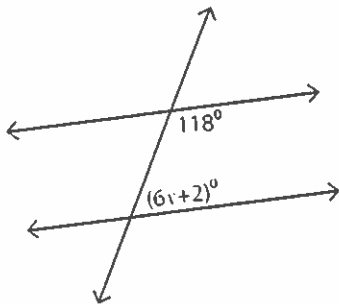
$x = \underline{29}$

6)



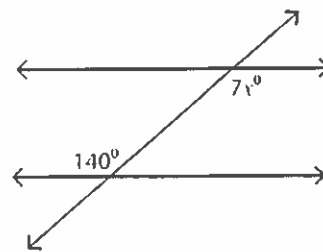
$x = \underline{17}$

7)



$x = \underline{10}$

8)

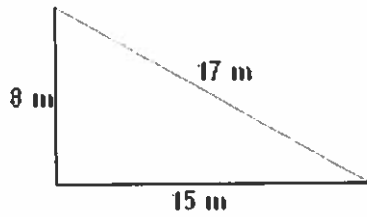


$x = \underline{20}$

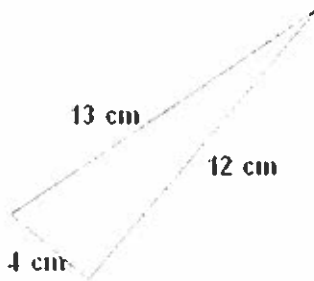
Student Name: _____

Score: _____

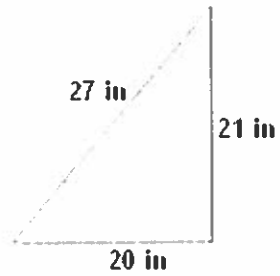
Answers



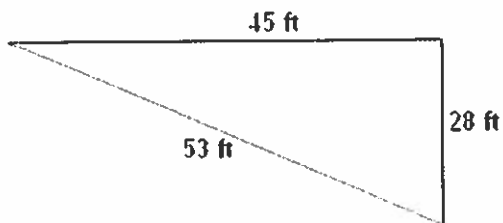
Answer: It is a right triangle.



Answer: It is not a right triangle.



Answer: It is not a right triangle.

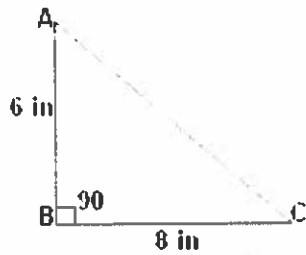


Answer: It is a right triangle.

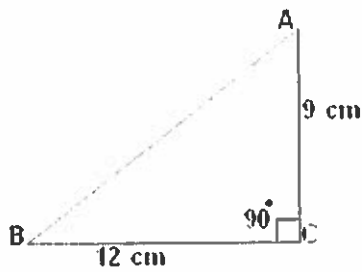
Student Name: _____

Score: _____

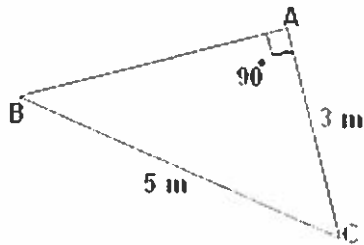
Answers



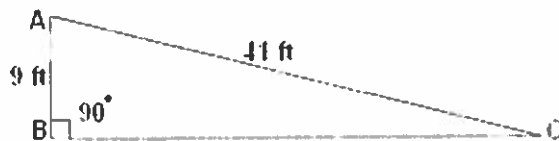
Length of AC = 10 in



Length of AB = 15 cm



Length of AB = 4 m

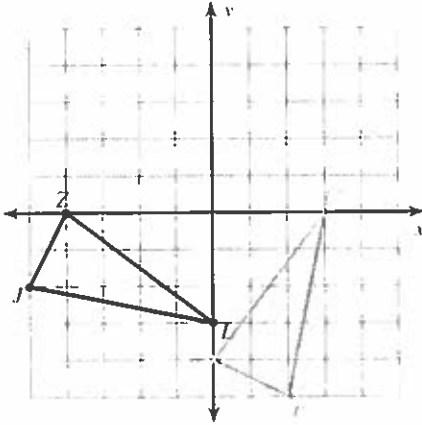


Length of BC = 40 ft

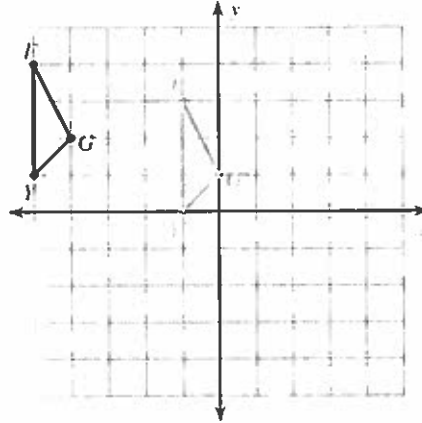
All Transformations

Graph the image of the figure using the transformation given.

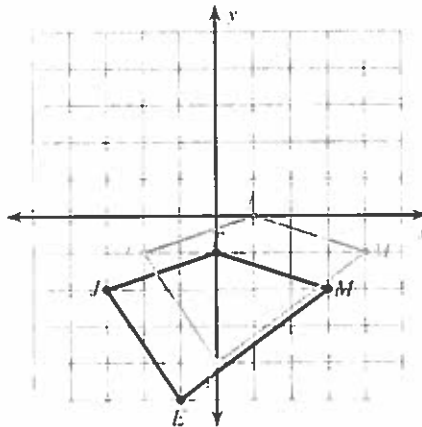
- 1) rotation 90° counterclockwise about the origin



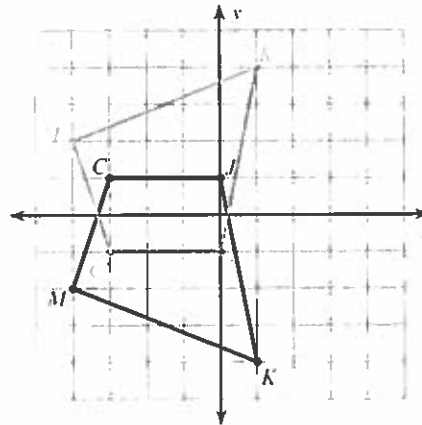
- 2) translation: 4 units right and 1 unit down



- 3) translation: 1 unit right and 1 unit up

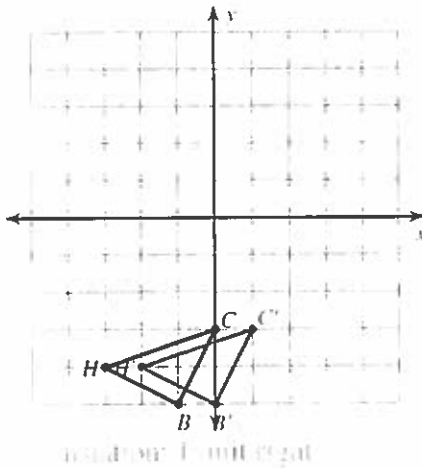


- 4) reflection across the x-axis

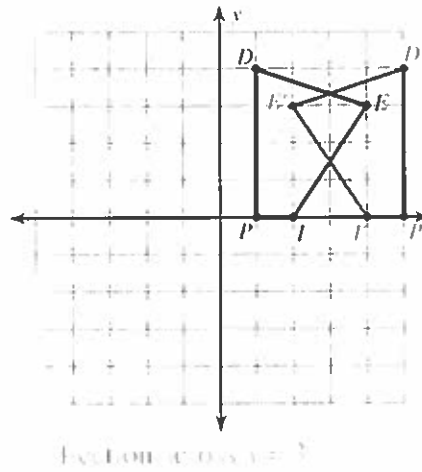


Write a rule to describe each transformation.

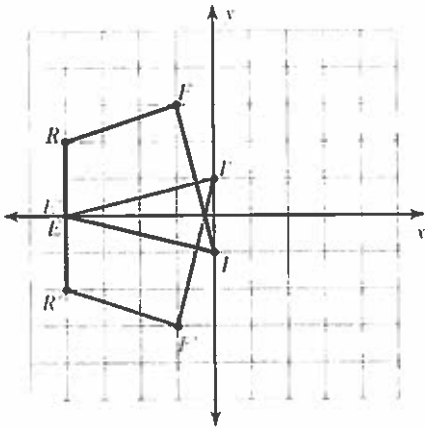
- 5)



- 6)

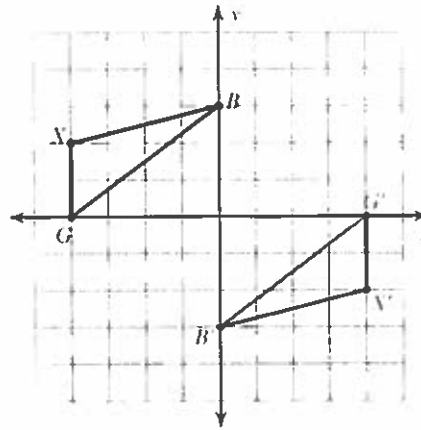


7)



reflection across the y -axis

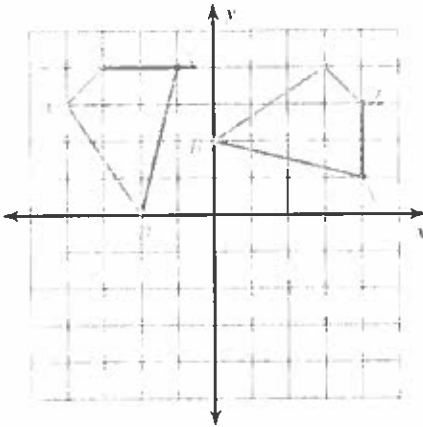
8)



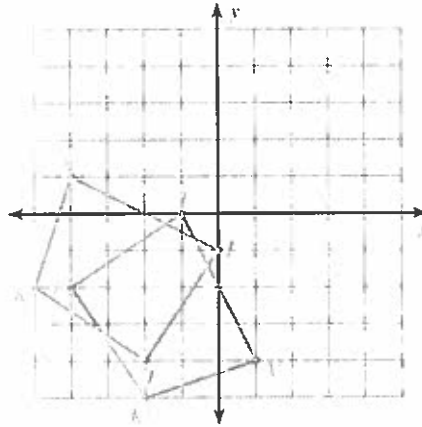
rotation 180° about the origin

Graph the image of the figure using the transformation given.

- 9) rotation 90° clockwise about the origin
 $B(-2, 0)$, $C(-4, 3)$, $Z(-3, 4)$, $X(-1, 4)$



- 10) reflection across $y = x$
 $K(-5, -2)$, $A(-4, 1)$, $I(0, -1)$, $J(-2, -4)$



Find the coordinates of the vertices of each figure after the given transformation.

- 11) rotation 180° about the origin
 $E(2, -2)$, $J(1, 2)$, $R(3, 3)$, $S(5, 2)$

$E'(-2, 2)$, $J'(-1, -2)$, $R'(-3, -3)$, $S'(-5, -2)$

- 12) reflection across $y = 2$
 $J(1, 3)$, $U(0, 5)$, $R(1, 5)$, $C(3, 2)$

$J'(1, 1)$, $U'(0, -1)$, $R'(1, -1)$, $C'(3, 2)$

- 13) translation: 7 units right and 1 unit down
 $J(-3, 1)$, $F(-2, 3)$, $N(-2, 0)$

$J'(4, 0)$, $F'(5, 2)$, $N'(5, -1)$

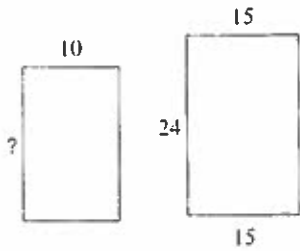
- 14) translation: 6 units right and 3 units down
 $S(-3, 3)$, $C(-1, 4)$, $W(-2, -1)$

$S'(3, 0)$, $C'(5, 1)$, $W'(4, -4)$

Using Similar Polygons

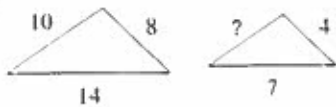
The polygons in each pair are similar. Find the missing side length.

1)



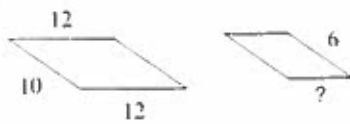
10

3)



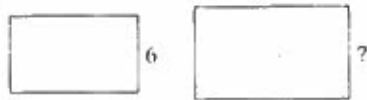
8

5)



10

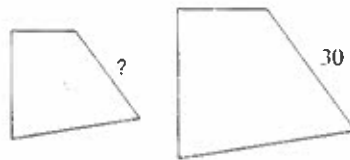
7)



scale factor from A to B = 2 : 7

21

9)



scale factor from A to B = 5 : 6

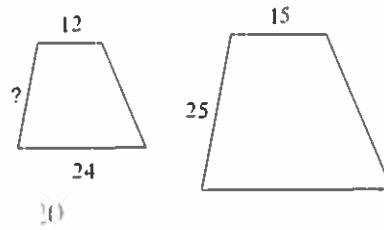
25

11)

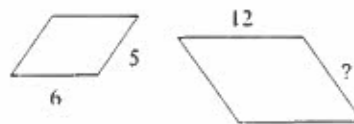


scale factor from A to B = 2 : 3

2)

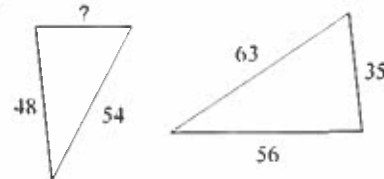


4)



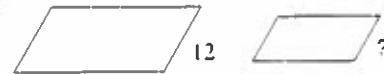
10

6)



10

8)



scale factor from A to B = 2 : 3

5

10)



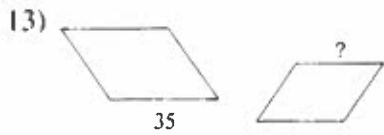
scale factor from A to B = 1 : 7

10

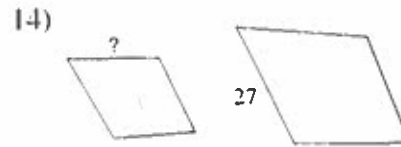
12)



scale factor from A to B = 1 : 2

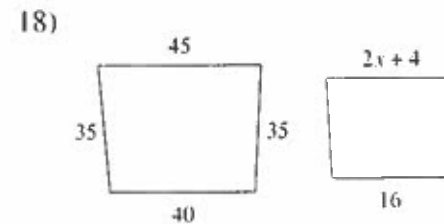
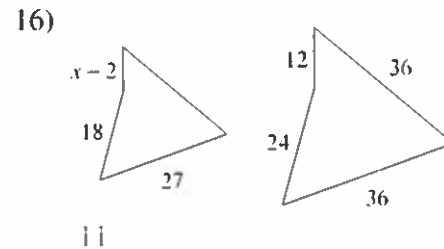
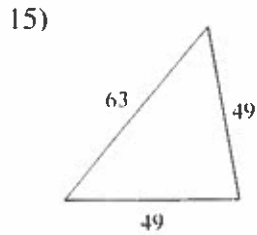


scale factor from A to B = 6 : 7

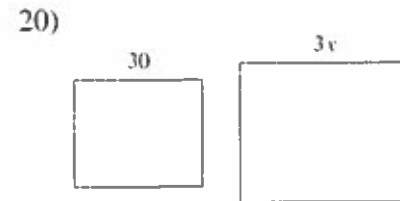


scale factor from A to B = 1 : 3

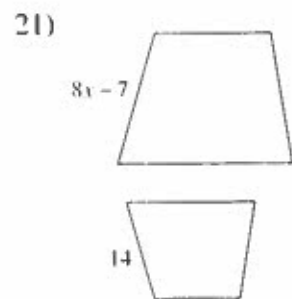
Solve for x . The polygons in each pair are similar.



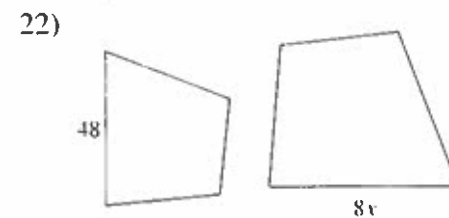
scale factor from A to B = 5 : 6



scale factor from A to B = 5 : 6



scale factor from A to B = 2 : 7



scale factor from A to B = 6 : 7