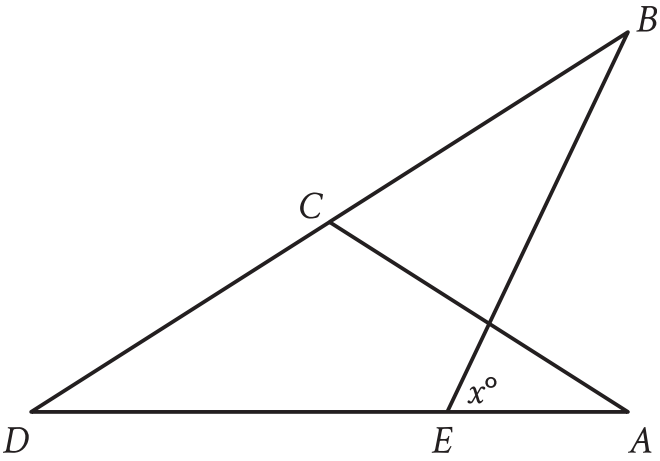
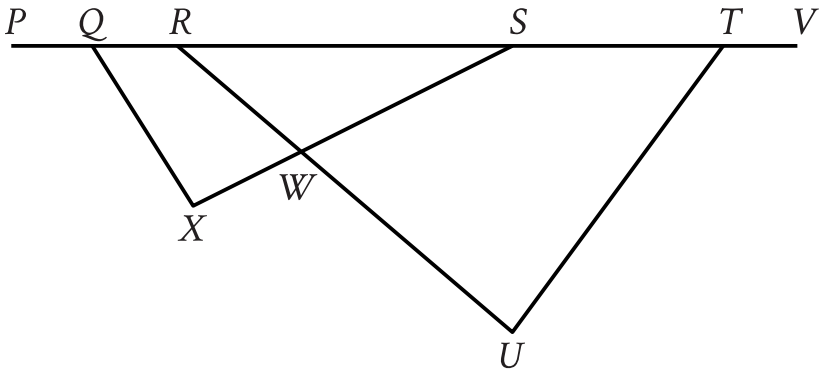
ID: 6d99b141



Note: Figure not drawn to scale.

In the figure, $AC = CD$. The measure of angle EBC is 45°, and the measure of angle ACD is 104°. What is the value of x?

ID: e10d8313



Note: Figure not drawn to scale.

In the figure shown, points Q, R, S, and T lie on line segment PV, and line segment RU intersects line segment SX at point W. The measure of $\angle SQX$ is 48°, the measure of $\angle SXQ$ is 86°, the measure of $\angle SWU$ is 85°, and the measure of $\angle VTU$ is 162°. What is the measure, in degrees, of $\angle TUR$?

ID: bcb66188

Triangle FGH is similar to triangle JKL, where angle F corresponds to angle J and angles G and K are right angles. If $\sin(F) = \frac{308}{317}$, what is the value of $\sin(J)$?

A. $\frac{75}{317}$

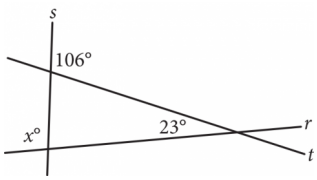
B. $\frac{308}{317}$

C. $\frac{317}{308}$

D. $\frac{317}{75}$

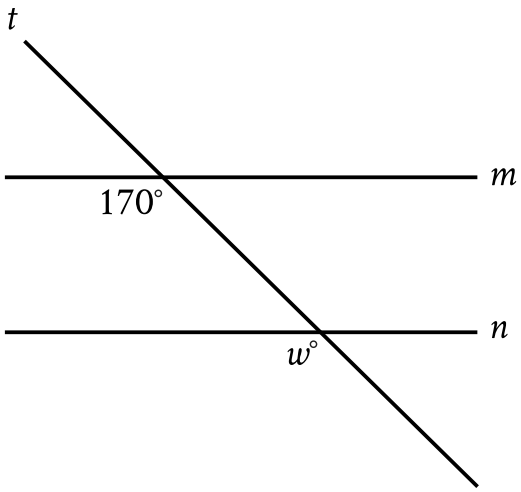
ID: f88f27e5

Intersecting lines r, s, and t are shown below.



What is the value of x ?

ID: 5207e508



Note: Figure not drawn to scale.

In the figure, line m is parallel to line n. What is the value of w?

A. 17

B. 30

C. 70

D. 170

ID: f67e4efc

A right circular cylinder has a volume of 45π. If the height of the cylinder is 5, what is the radius of the cylinder?

A. 3

B. 4.5

C. 9

D. 40

ID: e5c57163

Square A has side lengths that are 166 times the side lengths of square B. The area of square A is k times the area of square B. What is the value of k?

ID: 33e29881

In right triangle RST, the sum of the measures of angle R and angle S is 90 degrees. The value of $\sin(R)$ is $\frac{\sqrt{15}}{4}$. What is the value of $\cos(S)$?

A. $\frac{\sqrt{15}}{15}$

B. $\frac{\sqrt{15}}{4}$

C. $\frac{4\sqrt{15}}{15}$

D. $\sqrt{15}$

ID: 5252e606

The side length of a square is 55 centimeters (cm). What is the area, in cm^2, of the square?

A. 110

B. 220

C. $3{,}025$

D. $12{,}100$

ID: 5afbdc8e

What is the length of one side of a square that has the same area as a circle with radius 2 ?

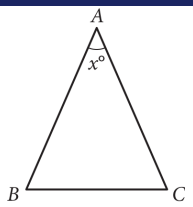
A. 2

B. $\sqrt{2\pi}$

C. $2\sqrt{\pi}$

D. 2π

ID: c8d60e48



In the given triangle, $AB = AC$ and $\angle ABC$ has a measure of $67°$. What is the value of x ?

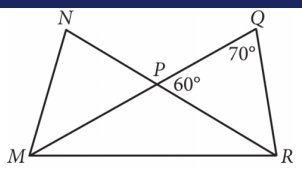
A. 36

B. 46

C. 58

D. 70

ID: 947a3cde



In the figure above, $\overline{MQ}$ and $\overline{NR}$ intersect at point P, $NP = QP$, and $MP = PR$. What is the measure, in degrees, of $\angle QMR$? (Disregard the degree symbol when gridding your answer.)

ID: 1f0b582e

Square X has a side length of 12 centimeters. The perimeter of square Y is 2 times the perimeter of square X. What is the length, in centimeters, of one side of square Y?

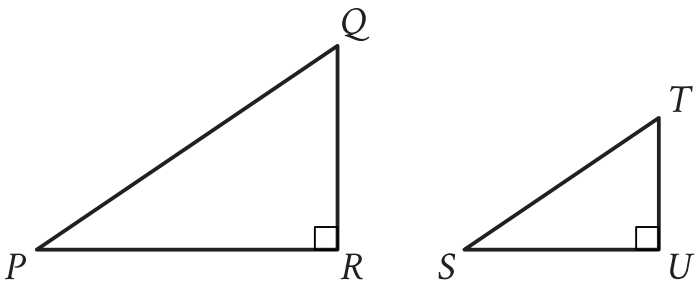
A. 6

B. 10

C. 14

D. 24

ID: d5f349b7



Note: Figures not drawn to scale.

Right triangles PQR and STU are similar, where P corresponds to S. If the measure of angle Q is 18°, what is the measure of angle S?

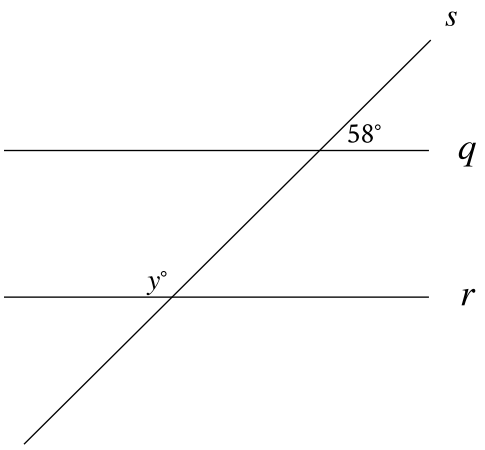
A. 18°

B. 72°

C. 82°

D. 162°

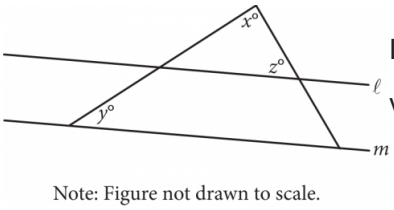
ID: 686b5212



Note: Figure not drawn to scale.

In the figure, line q is parallel to line r, and both lines are intersected by line s. If $y = 2x + 8$, what is the value of x?

ID: a6dbad6b



Note: Figure not drawn to scale.

In the figure above, lines ℓ and m are parallel, $y = 20$, and $z = 60$. What is the value of x ?

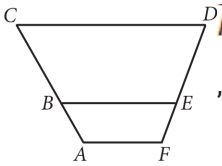
A. 120

B. 100

C. 90

D. 80

ID: 81b664bc



In the figure above, $\overline{AF}$, $\overline{BE}$, and $\overline{CD}$ are parallel. Points *B* and *E* lie on $\overline{AC}$ and $\overline{FD}$, respectively. If $AB = 9$, $BC = 18.5$, and $FE = 8.5$, what is the length of $\overline{ED}$, to the nearest tenth?

A. 16.8

B. 17.5

C. 18.4

D. 19.6

ID: 59cb654c

The area of a square is 64 square inches. What is the side length, in inches, of this square?

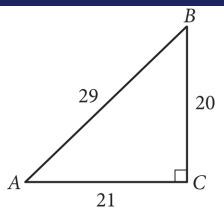
A. 8

B. 16

C. 64

D. 128

ID: 902dc959



In the figure above, what is the value of $\tan(A)$?

A. $\frac{20}{29}$

B. $\frac{21}{29}$

C. $\frac{20}{21}$

D. $\frac{21}{20}$

ID: ec5d4823

What is the volume, in cubic centimeters, of a right rectangular prism that has a length of 4 centimeters, a width of 9 centimeters, and a height of 10 centimeters?

ID: 9966235e

A cube has an edge length of 68 inches. A solid sphere with a radius of 34 inches is inside the cube, such that the sphere touches the center of each face of the cube. To the nearest cubic inch, what is the volume of the space in the cube not taken up by the sphere?

A. $149{,}796$

B. $164{,}500$

C. $190{,}955$

D. $310{,}800$

ID: a0369739

In triangle ABC, the measure of angle B is 90° and $\overline{BD}$ is an altitude of the triangle. The length of $\overline{AB}$ is 15 and the length of $\overline{AC}$ is 23 greater than the length of $\overline{AB}$. What is the value of $\frac{BC}{BD}$?

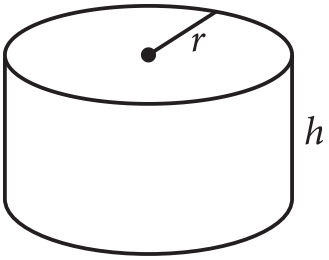
A. $\frac{15}{38}$

B. $\frac{15}{23}$

C. $\frac{23}{15}$

D. $\frac{38}{15}$

ID: a07ed090



The figure shown is a right circular cylinder with a radius of r and height of h. A second right circular cylinder (not shown) has a volume that is 392 times as large as the volume of the cylinder shown. Which of the following could represent the radius R, in terms of r, and the height H, in terms of h, of the second cylinder?

A. $R = 8r$ and $H = 7h$

B. $R = 8r$ and $H = 49h$

C. $R = 7r$ and $H = 8h$

D. $R = 49r$ and $H = 8h$

ID: cbe8ca31

In $\triangle XYZ$, the measure of $\angle X$ is 24° and the measure of $\angle Y$ is 98°. What is the measure of $\angle Z$?

A. 58°

B. 74°

C. 122°

D. 212°

ID: 94364a79

Two nearby trees are perpendicular to the ground, which is flat. One of these trees is 10 feet tall and has a shadow that is 5 feet long. At the same time, the shadow of the other tree is 2 feet long. How tall, in feet, is the other tree?

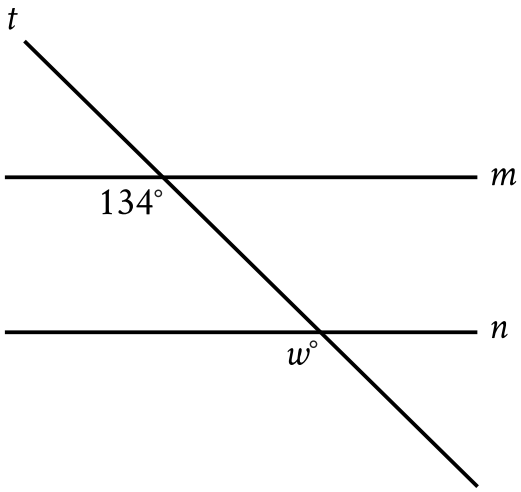
A. 3

B. 4

C. 8

D. 27

ID: c24e1bda



Note: Figure not drawn to scale.

In the figure, line m is parallel to line n. What is the value of w?

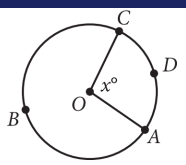
A. **13**

B. **34**

C. **66**

D. **134**

ID: c8345903



The circle above has center O, the length of arc $\overset{\frown}{ADC}$ is 5π, and $x = 100$. What is the length of arc $\overset{\frown}{ABC}$?

A. 9π

B. 13π

C. 18π

D. $\frac{13}{2}\pi$

ID: 901c3215

In triangles ABC and DEF, angles B and E each have measure 27° and angles C and F each have measure 41°. Which additional piece of information is sufficient to determine whether triangle ABC is congruent to triangle DEF?

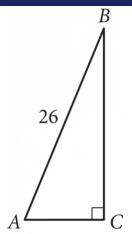
A. The measure of angle A

B. The length of side AB

C. The lengths of sides BC and EF

D. No additional information is necessary.

ID: bd87bc09



Triangle ABC above is a right triangle, and $\sin(B) = \frac{5}{13}$.

What is the length of side $\overline{BC}$?

ID: f7dbde16

In triangles LMN and RST, angles L and R each have measure 60°, $LN = 10$, and $RT = 30$. Which additional piece of information is sufficient to prove that triangle LMN is similar to triangle RST?

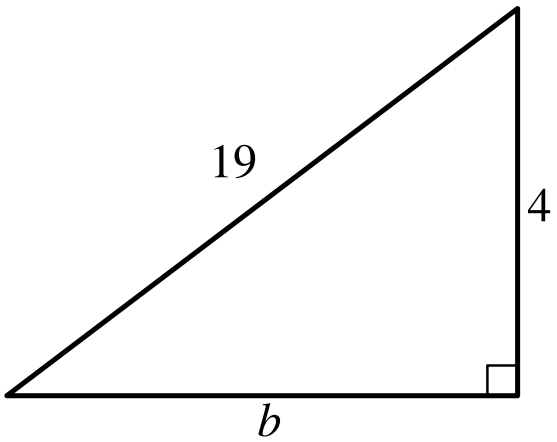
A. $MN = 7$ and $ST = 7$

B. $MN = 7$ and $ST = 21$

C. The measures of angles M and S are 70° and 60°, respectively.

D. The measures of angles M and T are 70° and 50°, respectively.

ID: b0c5ece5



Note: Figure not drawn to scale.

Which equation shows the relationship between the side lengths of the given triangle?

A. $4b = 19$

B. $4 + b = 19$

C. $4^2 + b^2 = 19^2$

D. $4^2 - b^2 = 19^2$

ID: 76c73dbf

The graph of $x^2 + x + y^2 + y = \frac{199}{2}$ in the *xy*-plane is a circle. What is the length of the circle's radius?

ID: e336a1d2

A cube has an edge length of 41 inches. What is the volume, in cubic inches, of the cube?

A. 164

B. $1{,}681$

C. $10{,}086$

D. $68{,}921$

ID: c0586eb5

A cylinder has a diameter of 8 inches and a height of 12 inches. What is the volume, in cubic inches, of the cylinder?

A. 16π

B. 96π

C. 192π

D. 768π

ID: 151eda3c

A manufacturing company produces two sizes of cylindrical containers that each have a height of 50 centimeters. The radius of container A is 16 centimeters, and the radius of container B is 25% longer than the radius of container A. What is the volume, in cubic centimeters, of container B?

A. $16{,}000\pi$

B. $20{,}000\pi$

C. $25{,}000\pi$

D. $31{,}250\pi$

ID: 2266984b

$$x^2+20x+y^2+16y=-20$$

The equation above defines a circle in the *xy*-plane. What are the coordinates of the center of the circle?

A. $(-20,-16)$

B. $(-10,-8)$

C. $(10,8)$

D. $(20,16)$

ID: d0b6d927

A rectangle has an area of 63 square meters and a length of 9 meters. What is the width, in meters, of the rectangle?

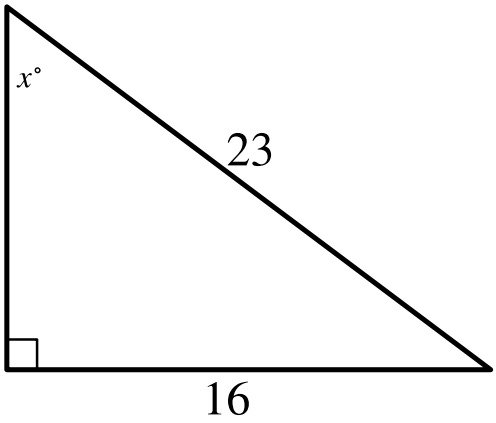
A. 7

B. 54

C. 81

D. 567

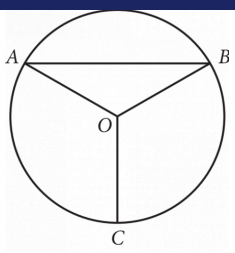
ID: 1429dcdf



Note: Figure not drawn to scale.

In the triangle shown, what is the value of $\sin x^\circ$?

ID: 69b0d79d



Point O is the center of the circle above, and the measure of $\angle OAB$ is $30°$. If the length of $\overline{OC}$ is 18, what is the length of arc $\overset{\frown}{AB}$?

A. 9π

B. 12π

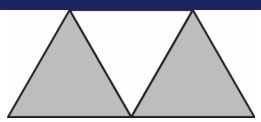
C. 15π

D. 18π

ID: ebbf23ae

A circle in the *xy*-plane has a diameter with endpoints $(2, 4)$ and $(2, 14)$. An equation of this circle is $(x - 2)^2 + (y - 9)^2 = r^2$, where r is a positive constant. What is the value of r?

ID: 4c95c7d4



A graphic designer is creating a logo for a company. The logo is shown in the figure above. The logo is in the shape of a trapezoid and consists of three congruent equilateral triangles. If the perimeter of the logo is 20 centimeters, what is the combined area of the shaded regions, in square centimeters, of the logo?

A. $2\sqrt{3}$

B. $4\sqrt{3}$

C. $8\sqrt{3}$

D. 16

ID: b8a225ff

Circle A in the *xy*-plane has the equation $(x+5)^2+(y-5)^2=4$. Circle B has the same center as circle A. The radius of circle B is two times the radius of circle A. The equation defining circle B in the *xy*-plane is $(x+5)^2+(y-5)^2=k$, where k is a constant. What is the value of k?

ID: b0a72bdc

What is the diameter of the circle in the *xy*-plane with equation $(x-5)^2+(y-3)^2=16$?

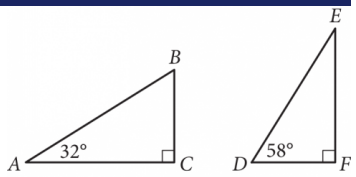
A. 4

B. 8

C. 16

D. 32

ID: 933fee1a



Triangles *ABC* and *DEF* are shown above. Which of the following is equal to the ratio $\frac{BC}{AB}$?

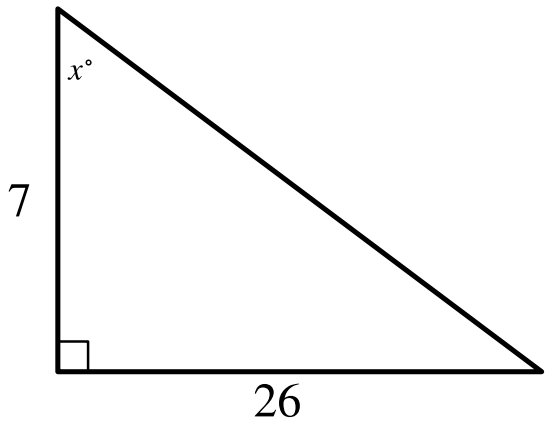
A. $\frac{DE}{DF}$

B. $\frac{DF}{DE}$

C. $\frac{DF}{EF}$

D. $\frac{EF}{DE}$

ID: 64c1f044



Note: Figure not drawn to scale.

In the triangle shown, what is the value of $\tan x^\circ$?

A. $\frac{1}{26}$

B. $\frac{19}{26}$

C. $\frac{26}{7}$

D. $\frac{33}{7}$

ID: ba8ca563

A cube has a volume of $474{,}552$ cubic units. What is the surface area, in square units, of the cube?

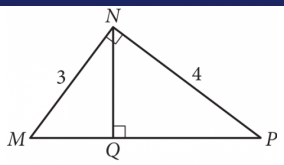
ID: a4bd60a3

The perimeter of an equilateral triangle is 624 centimeters. The height of this triangle is $k\sqrt{3}$ centimeters, where k is a constant. What is the value of k?

ID: 899c6042

A right circular cone has a height of 22 centimeters (cm) and a base with a diameter of 6 cm. The volume of this cone is $n\pi$ cm^3. What is the value of n?

ID: 740bf79f



In the figure above, what is the length of $\overline{NQ}$?

A. 2.2

B. 2.3

C. 2.4

D. 2.5

ID: 3b225698

Triangle XYZ is similar to triangle RST such that X, Y, and Z correspond to R, S, and T, respectively. The measure of $\angle Z$ is 20° and $2XY = RS$. What is the measure of $\angle T$?

A. 2°

B. 10°

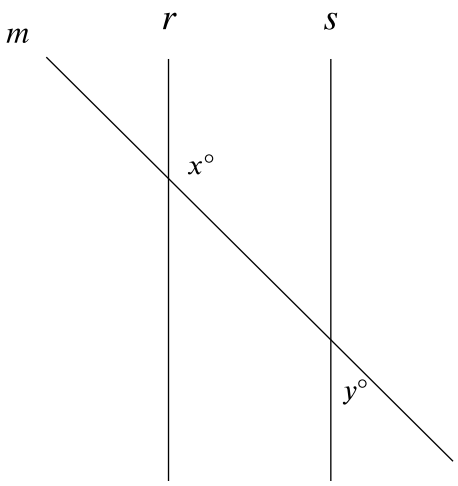
C. 20°

D. 40°

ID: 249d3f80

Point O is the center of a circle. The measure of arc RS on this circle is 100°. What is the measure, in degrees, of its associated angle ROS?

ID: a4c05a1b



Note: Figure not drawn to scale.

In the figure shown, lines r and s are parallel, and line m intersects both lines. If $y < 65$, which of the following must be true?

A. $x < 115$

B. $x > 115$

C. $x + y < 180$

D. $x + y > 180$

ID: 38517165

A circle has a circumference of 31π centimeters. What is the diameter, in centimeters, of the circle?

ID: ab176ad6

The equation $(x+6)^2+(y+3)^2=121$ defines a circle in the *xy*-plane. What is the radius of the circle?

ID: d3fe472f

Triangle ABC is similar to triangle XYZ, such that A, B, and C correspond to X, Y, and Z respectively. The length of each side of triangle XYZ is 2 times the length of its corresponding side in triangle ABC. The measure of side AB is 16. What is the measure of side XY?

A. 14

B. 16

C. 18

D. 32

ID: f9d40000

In $\triangle XYZ$, the measure of $\angle X$ is 23° and the measure of $\angle Y$ is 66°. What is the measure of $\angle Z$?

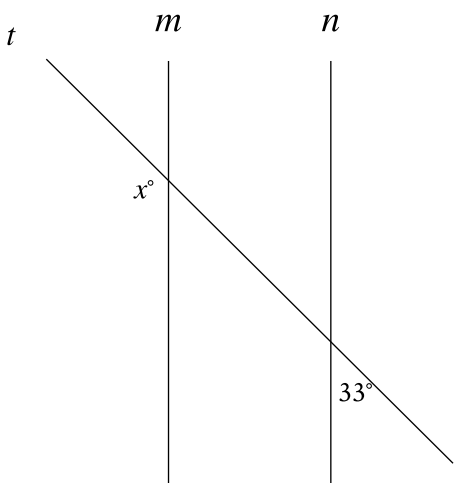
A. 43°

B. 89°

C. 91°

D. 179°

ID: 0d3f51dc



Note: Figure not drawn to scale.

In the figure, line m is parallel to line n, and line t intersects both lines. What is the value of x?

A. 33

B. 57

C. 123

D. 147

ID: fd8745fc

In triangle JKL, the measures of $\angle K$ and $\angle L$ are each 48°. What is the measure of $\angle J$, in degrees? (Disregard the degree symbol when entering your answer.)

ID: 3e577e4a

A circle in the *xy*-plane has its center at $(-4, -6)$. Line k is tangent to this circle at the point $(-7, -7)$. What is the slope of line k?

A. -3

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

C. $\frac{1}{3}$

D. 3

ID: b0dc920d

A manufacturer determined that right cylindrical containers with a height that is 4 inches longer than the radius offer the optimal number of containers to be displayed on a shelf. Which of the following expresses the volume, V, in cubic inches, of such containers, where r is the radius, in inches?

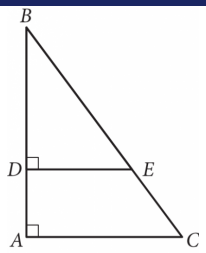
A. $V = 4\pi r^3$

B. $V = \pi(2r)^3$

C. $V = \pi r^2 + 4\pi r$

D. $V = \pi r^3 + 4\pi r^2$

ID: 55bb437a



In the figure above, $\tan B = \frac{3}{4}$. If $BC = 15$ and $DA = 4$, what is the length of $\overline{DE}$?

ID: c7bed21d

Quadrilateral $P'Q'R'S'$ is similar to quadrilateral $PQRS$, where P, Q, R, and S correspond to P', Q', R', and S', respectively. The measure of angle P is 30°, the measure of angle Q is 50°, and the measure of angle R is 70°. The length of each side of $P'Q'R'S'$ is 3 times the length of each corresponding side of $PQRS$. What is the measure of angle P'?

A. 10°

B. 30°

C. 40°

D. 90°

ID: 8e7689e0

The number of radians in a 720-degree angle can be written as $a\pi$, where *a* is a constant. What is the value of *a* ?

ID: 3563d76d

At a certain time and day, the Washington Monument in Washington, DC, casts a shadow that is 300 feet long. At the same time, a nearby cherry tree casts a shadow that is 16 feet long. Given that the Washington Monument is approximately 555 feet tall, which of the following is closest to the height, in feet, of the cherry tree?

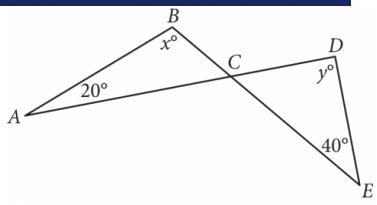
A. 10

B. 20

C. 30

D. 35

ID: dfc420b2



Note: Figure not drawn to scale.

In the figure above, $\overline{AD}$ intersects $\overline{BE}$ at C. If $x = 100$, what is the value of y ?

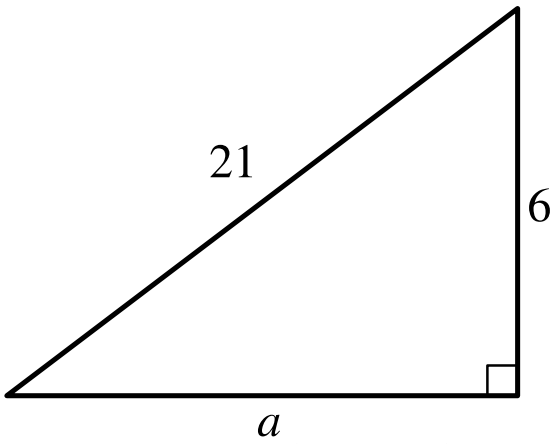
A. 100

B. 90

C. 80

D. 60

ID: de550be0



Note: Figure not drawn to scale.

For the triangle shown, which expression represents the value of a?

A. $\sqrt{21^2 - 6^2}$

B. $21^2 - 6^2$

C. $\sqrt{21 - 6}$

D. $21 - 6$

ID: 901e3285

In triangle *ABC*, the measure of angle *A* is $50°$. If triangle *ABC* is isosceles, which of the following is NOT a possible measure of angle *B* ?

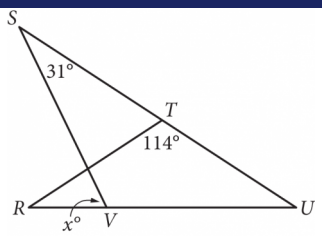
A. $50°$

B. $65°$

C. $80°$

D. $100°$

ID: bd7f6e30



In the figure above, $RT = TU$.

What is the value of x ?

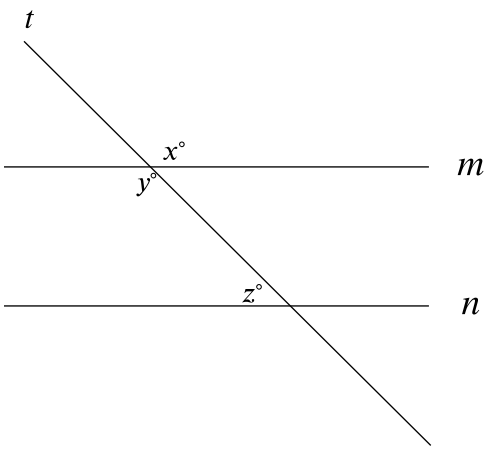
A. 72

B. 66

C. 64

D. 58

ID: 2adbf1b1



Note: Figure not drawn to scale.

In the figure, lines m and n are parallel. If $x = 6k + 13$ and $y = 8k - 29$, what is the value of z?

A. 3

B. 21

C. 41

D. 139

ID: ffe862a3

An isosceles right triangle has a hypotenuse of length 58 inches. What is the perimeter, in inches, of this triangle?

A. $29\sqrt{2}$

B. $58\sqrt{2}$

C. $58 + 58\sqrt{2}$

D. $58 + 116\sqrt{2}$

ID: 24cec8d1

A circle has center O, and points R and S lie on the circle. In triangle ORS, the measure of $\angle ROS$ is 88°. What is the measure of $\angle RSO$, in degrees? (Disregard the degree symbol when entering your answer.)

ID: 0837c3b9

Triangle *ABC* and triangle *DEF* are similar triangles, where $\overline{AB}$ and $\overline{DE}$ are corresponding sides. If $DE = 2AB$ and the perimeter of triangle *ABC* is 20, what is the perimeter of triangle *DEF* ?

A. 10

B. 40

C. 80

D. 120

ID: 9e44284b

In the *xy*-plane, the graph of $2x^2-6x+2y^2+2y=45$ is a circle. What is the radius of the circle?

A. 5

B. 6.5

C. $\sqrt{40}$

D. $\sqrt{50}$

ID: 568d66a7

An isosceles right triangle has a perimeter of $94 + 94\sqrt{2}$ inches. What is the length, in inches, of one leg of this triangle?

A. 47

B. $47\sqrt{2}$

C. 94

D. $94\sqrt{2}$

ID: 0e709a29

$RS = 440\ ST = 384\ TR = 584$

The side lengths of right triangle RST are given. Triangle RST is similar to triangle UVW, where S corresponds to V and T corresponds to W. What is the value of $\tan W$?

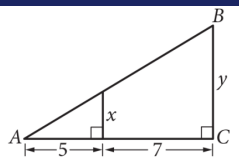
A. $\frac{48}{73}$

B. $\frac{55}{73}$

C. $\frac{48}{55}$

D. $\frac{55}{48}$

ID: eeb4143c



Note: Figure not drawn to scale.

The area of triangle *ABC* above is at least 48 but no more than 60. If *y* is an integer, what is one possible value of *x* ?

ID: 5b2b8866

A rectangular poster has an area of 360 square inches. A copy of the poster is made in which the length and width of the original poster are each increased by 20%. What is the area of the copy, in square inches?

ID: 9f934297

A right rectangular prism has a length of 28 centimeters (cm), a width of 15 cm, and a height of 16 cm. What is the surface area, in cm^2, of the right rectangular prism?

ID: 575f1e12

What is the area, in square centimeters, of a rectangle with a length of 34 centimeters (cm) and a width of 29 cm?

ID: 74d8b897

An angle has a measure of $\frac{9\pi}{20}$ radians. What is the measure of the angle in degrees?

ID: dc71597b

A right circular cone has a volume of $\frac{1}{3}\pi$ cubic feet and a height of 9 feet. What is the radius, in feet, of the base of the cone?

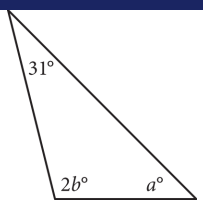
A. $\frac{1}{3}$

B. $\frac{1}{\sqrt{3}}$

C. $\sqrt{3}$

D. 3

ID: 410bdbe6



In the triangle above, $a = 45$. What is the value of b ?

A. 52

B. 59

C. 76

D. 104

ID: a0cacec1

An angle has a measure of $\frac{16\pi}{15}$ radians. What is the measure of the angle, in degrees?

ID: f811d345

A right triangle has legs with lengths of 24 centimeters and 21 centimeters. If the length of this triangle's hypotenuse, in centimeters, can be written in the form $3\sqrt{d}$, where d is an integer, what is the value of d?

ID: c9931030

$RS = 20\ ST = 48\ TR = 52$

The side lengths of right triangle RST are given. Triangle RST is similar to triangle UVW, where S corresponds to V and T corresponds to W. What is the value of $\tan W$?

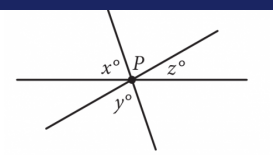
A. $\frac{5}{13}$

B. $\frac{5}{12}$

C. $\frac{12}{13}$

D. $\frac{12}{5}$

ID: 087cdcfd



Note: Figure not drawn to scale.

In the figure, three lines intersect at point *P*. If $x = 65$ and $y = 75$, what is the value of *z* ?

A. 140

B. 80

C. 40

D. 20

ID: c88183f7

A rectangle has a length of 13 and a width of 6. What is the perimeter of the rectangle?

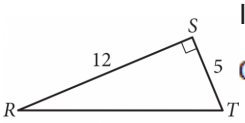
A. 12

B. 26

C. 38

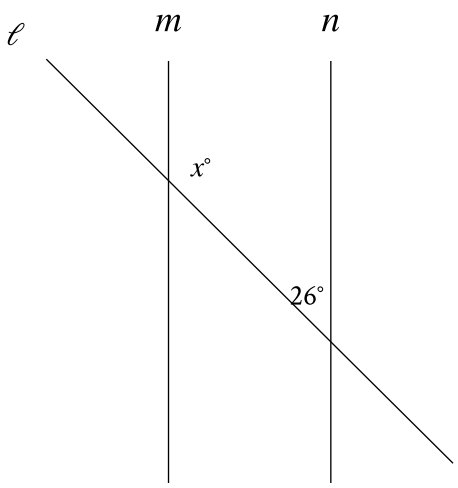
D. 52

ID: 6933b3d9



In triangle *RST* above, point *W* (not shown) lies on $\overline{RT}$. What is the value of $\cos(\angle RSW) - \sin(\angle WST)$?

ID: afa3c48b



Note: Figure not drawn to scale.

In the figure shown, line m is parallel to line n. What is the value of x?

A. 13

B. 26

C. 52

D. 154

ID: 9ec76b54

A right triangle has legs with lengths of 28 centimeters and 20 centimeters. What is the length of this triangle's hypotenuse, in centimeters?

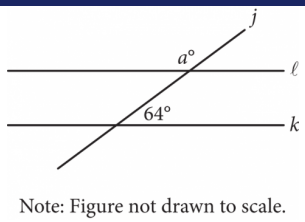
A. $8\sqrt{6}$

B. $4\sqrt{74}$

C. 48

D. $1{,}184$

ID: 992f4e93



Note: Figure not drawn to scale.

In the figure above, lines ℓ and k are parallel.

What is the value of a ?

A. 26

B. 64

C. 116

D. 154

ID: f1747a6a

In triangle ABC, the measure of angle B is 52° and the measure of angle C is 17°. What is the measure of angle A?

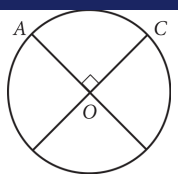
A. 21°

B. 35°

C. 69°

D. 111°

ID: 23c5fcce



The circle above with center *O* has a circumference of 36.

What is the length of minor arc $\overset{\frown}{AC}$?

A. 9

B. 12

C. 18

D. 36

ID: f1c1e971

The measure of angle R is $\frac{2\pi}{3}$ radians. The measure of angle T is $\frac{5\pi}{12}$ radians greater than the measure of angle R. What is the measure of angle T, in degrees?

A. 75

B. 120

C. 195

D. 390

ID: 6ab30ce3

Triangle ABC is similar to triangle DEF, where A corresponds to D and C corresponds to F. Angles C and F are right angles. If $\tan(A) = \sqrt{3}$ and $DF = 125$, what is the length of $\overline{DE}$?

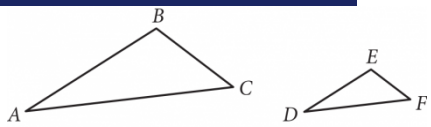
A. $125\frac{\sqrt{3}}{3}$

B. $125\frac{\sqrt{3}}{2}$

C. $125\sqrt{3}$

D. 250

ID: 1c3d613c



Note: Figures not drawn to scale.

Triangle *ABC* and triangle *DEF* are shown. The relationship between the side lengths of the two triangles is such that $\frac{AB}{DE} = \frac{BC}{EF} = \frac{AC}{DF} = 3$. If the measure of angle *BAC* is 20°, what is the measure, in degrees, of angle *EDF* ? (Disregard the degree symbol when gridding your answer.)

ID: 9acd101f

The equation $x^2 + (y - 1)^2 = 49$ represents circle A. Circle B is obtained by shifting circle A down 2 units in the *xy*-plane. Which of the following equations represents circle B?

A. msup $+ (y - 1)^2 = 49$

B. $x^2 +$ msup $= 49$

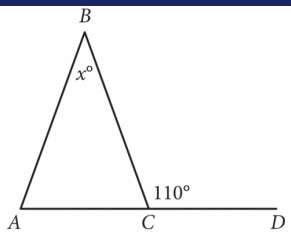
C. msup $+ (y - 1)^2 = 49$

D. $x^2 +$ msup $= 49$

ID: 08b7a3f5

A triangular prism has a height of 8 centimeters (cm) and a volume of 216 cm^3. What is the area, in cm^2, of the base of the prism? (The volume of a triangular prism is equal to Bh, where B is the area of the base and h is the height of the prism.)

ID: 5733ce30



In the given figure, $\overline{AC}$ extends to point *D*. If the measure of $\angle BAC$ is equal to the measure of $\angle BCA$, what is the value of *x* ?

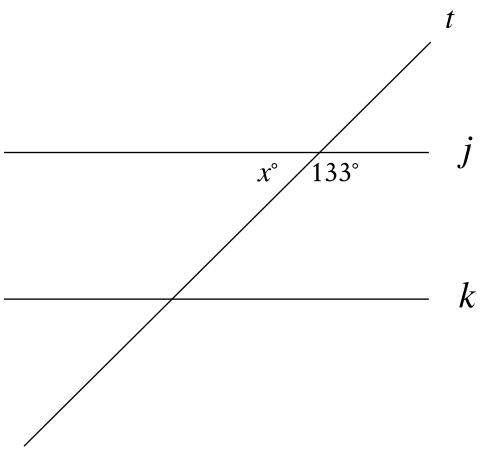
A. 110

B. 70

C. 55

D. 40

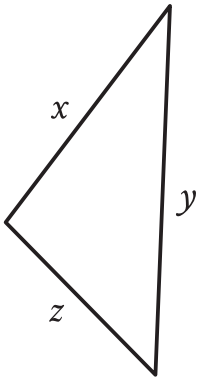
ID: 3b4b5b1e



Note: Figure not drawn to scale.

In the figure, line j is parallel to line k. What is the value of x?

ID: 29e9b28c



Note: Figure not drawn to scale.

The triangle shown has a perimeter of 22 units. If $x = 9$ units and $y = 7$ units, what is the value of z, in units?

A. 6

B. 7

C. 9

D. 16

ID: 5b4757df

In triangle RST, angle T is a right angle, point L lies on $\overline{RS}$, point K lies on $\overline{ST}$, and $\overline{LK}$ is parallel to $\overline{RT}$. If the length of $\overline{RT}$ is 72 units, the length of $\overline{LK}$ is 24 units, and the area of triangle RST is 792 square units, what is the length of $\overline{KT}$, in units?

ID: ca2235f6

A circle has center O, and points A and B lie on the circle. The measure of arc AB is $45°$ and the length of arc AB is 3 inches. What is the circumference, in inches, of the circle?

A. 3

B. 6

C. 9

D. 24

ID: 856372ca

In the *xy*-plane, a circle with radius 5 has center $(-8,6)$. Which of the following is an equation of the circle?

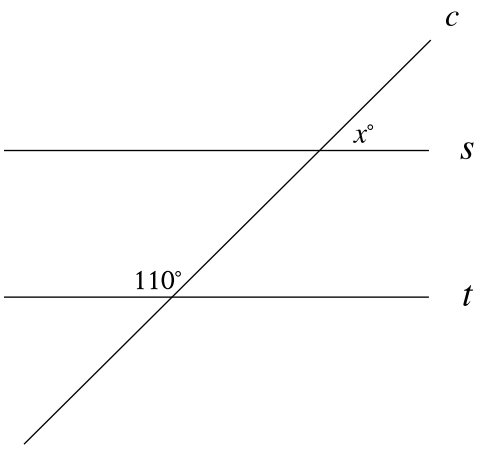
A. $(x-8)^2+(y+6)^2=25$

B. $(x+8)^2+(y-6)^2=25$

C. $(x-8)^2+(y+6)^2=5$

D. $(x+8)^2+(y-6)^2=5$

ID: cf0d3050



Note: Figure not drawn to scale.

In the figure shown, line c intersects parallel lines s and t. What is the value of x?

ID: 0bb39de4

Triangles ABC and DEF are congruent, where A corresponds to D, and B and E are right angles. The measure of angle A is 18°. What is the measure of angle F?

A. 18°

B. 72°

C. 90°

D. 162°

ID: 9d159400

Which of the following equations represents a circle in the *xy*-plane that intersects the *y*-axis at exactly one point?

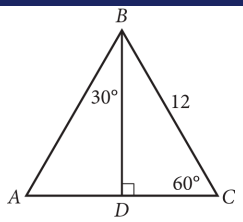
A. msup $+ (y - 8)^2 = 16$

B. msup $+ (y - 4)^2 = 16$

C. msup $+ (y - 9)^2 = 16$

D. $x^2 +$ msup $= 16$

ID: bf8d843e



In ΔABC above, what is the length of $\overline{AD}$?

A. 4

B. 6

C. $6\sqrt{2}$

D. $6\sqrt{3}$

ID: 3453aafc

What is the area, in square centimeters, of a rectangle with a length of 36 centimeters and a width of 34 centimeters?

A. 70

B. 140

C. $1{,}156$

D. $1{,}224$

ID: 981275d2

$(x-6)^2+(y+5)^2=16$

In the *xy*-plane, the graph of the equation above is a circle. Point *P* is on the circle and has coordinates $(10,-5)$. If $\overline{PQ}$ is a diameter of the circle, what are the coordinates of point *Q* ?

A. $(2,-5)$

B. $(6,-1)$

C. $(6,-5)$

D. $(6,-9)$

ID: 89661424

A circle in the *xy*-plane has its center at $(-5, 2)$ and has a radius of 9. An equation of this circle is $x^2 + y^2 + ax + by + c = 0$, where a, b, and c are constants. What is the value of c?

ID: 7c25b0dc

The length of a rectangle's diagonal is $3\sqrt{17}$, and the length of the rectangle's shorter side is 3. What is the length of the rectangle's longer side?

ID: e80d62c6

The equation $x^2 + (y - 2)^2 = 36$ represents circle A. Circle B is obtained by shifting circle A down 4 units in the *xy*-plane. Which of the following equations represents circle B?

A. $x^2 +$ msup $= 36$

B. $x^2 +$ msup $= 36$

C. msup $+ (y - 2)^2 = 36$

D. msup $+ (y - 2)^2 = 36$

ID: f243c383

Two identical rectangular prisms each have a height of 90 centimeters (cm). The base of each prism is a square, and the surface area of each prism is K cm^2. If the prisms are glued together along a square base, the resulting prism has a surface area of $\frac{92}{47}K$ cm^2. What is the side length, in cm, of each square base?

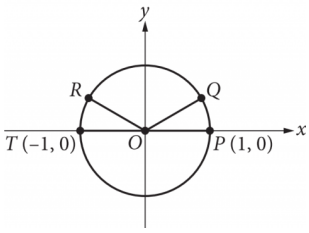
A. 4

B. 8

C. 9

D. 16

ID: 95ba2d09



In the *xy*-plane above, points *P*, *Q*, *R*, and *T* lie on the circle with center *O*. The degree measures of angles POQ and ROT are each 30°. What is the radian measure of angle QOR?

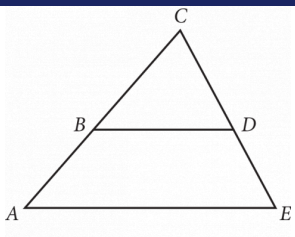
A. $\frac{5}{6}\pi$

B. $\frac{3}{4}\pi$

C. $\frac{2}{3}\pi$

D. $\frac{1}{3}\pi$

ID: 6dd463ca



Note: Figure not drawn to scale.

In the figure above, segments *AE* and *BD* are parallel. If angle *BDC* measures 58° and angle *ACE* measures 62°, what is the measure of angle *CAE* ?

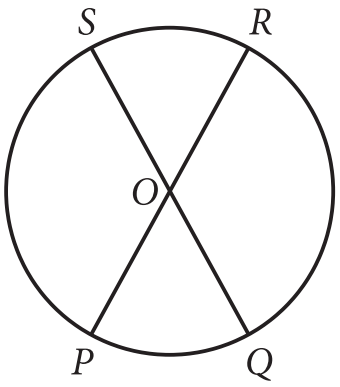
A. 58°

B. 60°

C. 62°

D. 120°

ID: 0815a5af



Note: Figure not drawn to scale.

The circle shown has center O, circumference 144π, and diameters $\overline{PR}$ and $\overline{QS}$. The length of arc PS is twice the length of arc PQ. What is the length of arc QR?

A. 24π

B. 48π

C. 72π

D. 96π

ID: 93de3f84

The volume of right circular cylinder A is 22 cubic centimeters. What is the volume, in cubic centimeters, of a right circular cylinder with twice the radius and half the height of cylinder A?

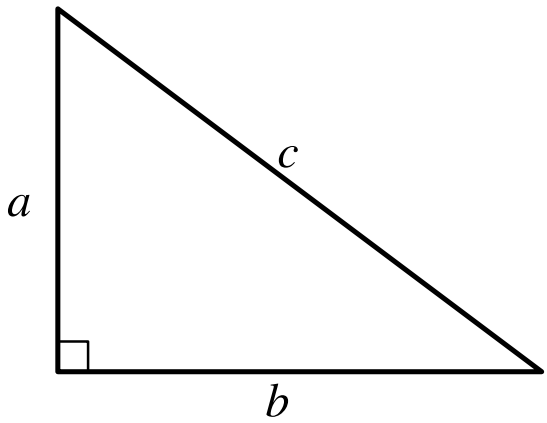
A. 11

B. 22

C. 44

D. 66

ID: c9f8d1e9



Note: Figure not drawn to scale.

For the right triangle shown, $a = 4$ and $b = 5$. Which expression represents the value of c?

A. $4 + 5$

B. $\sqrt{(4)(5)}$

C. $\sqrt{4 + 5}$

D. $\sqrt{4^2 + 5^2}$

ID: f60bb551

The area of a rectangle is 630 square inches. The length of the rectangle is 70 inches. What is the width, in inches, of this rectangle?

A. 9

B. 70

C. 315

D. 560

ID: d2047497

What is the area of a rectangle with a length of 17 centimeters (cm) and a width of 7 cm?

A. $24\ \text{cm}^2$

B. $48\ \text{cm}^2$

C. $119\ \text{cm}^2$

D. $576\ \text{cm}^2$

ID: a5aee181

The length of a rectangle's diagonal is $5\sqrt{17}$, and the length of the rectangle's shorter side is 5. What is the length of the rectangle's longer side?

A. $\sqrt{17}$

B. 20

C. $15\sqrt{2}$

D. 400

ID: fb58c0db

Points A and B lie on a circle with radius 1, and arc $\overset{\frown}{AB}$ has length $\frac{\pi}{3}$. What fraction of the circumference of the circle is the length of arc $\overset{\frown}{AB}$?

ID: ae041e52

A square is inscribed in a circle. The radius of the circle is $\frac{20\sqrt{2}}{2}$ inches. What is the side length, in inches, of the square?

A. 20

B. $\frac{20\sqrt{2}}{2}$

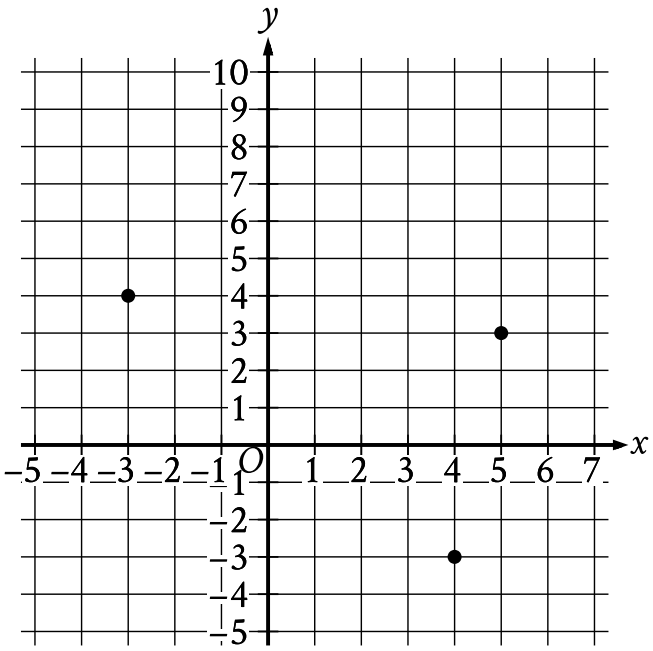
C. $20\sqrt{2}$

D. 40

ID: c6dff223

Triangle ABC is similar to triangle DEF, where angle A corresponds to angle D and angles C and F are right angles. The length of $\overline{AB}$ is 2.9 times the length of $\overline{DE}$. If $\tan A = \frac{21}{20}$, what is the value of $\sin D$?

ID: eb70d2d0



What is the area, in square units, of the triangle formed by connecting the three points shown?

ID: f329442c

Circle A has a radius of $3n$ and circle B has a radius of $129n$, where n is a positive constant. The area of circle B is how many times the area of circle A?

A. 43

B. 86

C. 129

D. $1{,}849$

ID: 92eb236a

In a right triangle, the tangent of one of the two acute angles is $\frac{\sqrt{3}}{3}$. What is the tangent of the other acute angle?

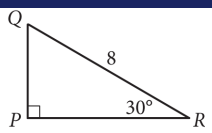
A. $-\frac{\sqrt{3}}{3}$

B. $-\frac{3}{\sqrt{3}}$

C. $\frac{\sqrt{3}}{3}$

D. $\frac{3}{\sqrt{3}}$

ID: 13d9a1c3

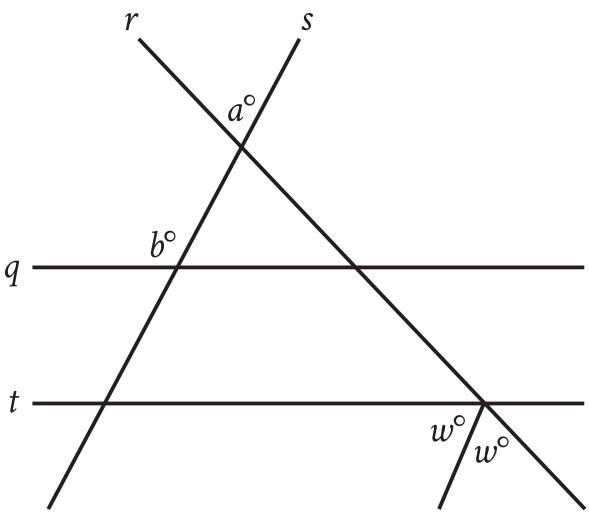


In the right triangle shown above, what is the length of $\overline{PQ}$?

ID: 76670c80

Each side of a square has a length of 45. What is the perimeter of this square?

ID: 17912810



Note: Figure not drawn to scale.

In the figure, parallel lines q and t are intersected by lines r and s. If $a = 43$ and $b = 122$, what is the value of w?

ID: 4420e500

What is the area of a rectangle with a length of 4 centimeters (cm) and a width of 2 cm?

A. $6\ \text{cm}^2$

B. $8\ \text{cm}^2$

C. $12\ \text{cm}^2$

D. $36\ \text{cm}^2$

ID: f7e626b2

The dimensions of a right rectangular prism are 4 inches by 5 inches by 6 inches.
What is the surface area, in square inches, of the prism?

A. 30

B. 74

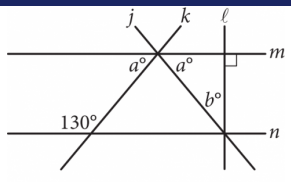
C. 120

D. 148

ID: 2be01bd9

Triangle ABC is similar to triangle DEF, where angle A corresponds to angle D and angle C corresponds to angle F. Angles C and F are right angles. If $\tan(A) = \frac{50}{7}$, what is the value of $\tan(E)$?

ID: 3828f53d



Note: Figure not drawn to scale.

In the figure above, lines m and n are parallel.
What is the value of b ?

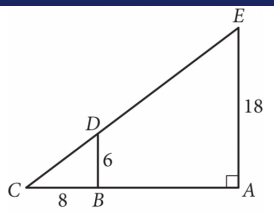
A. 40

B. 50

C. 65

D. 80

ID: dba6a25a



In the figure above, $\overline{BD}$ is parallel to $\overline{AE}$.

What is the length of $\overline{CE}$?

ID: acd30391

A circle in the *xy*-plane has equation $(x+3)^2+(y-1)^2=25$. Which of the following points does NOT lie in the interior of the circle?

A. $(-7, 3)$

B. $(-3, 1)$

C. $(0, 0)$

D. $(3, 2)$

ID: 4ff7b652

Right triangles LMN and PQR are similar, where L and M correspond to P and Q, respectively. Angle M has a measure of 53°. What is the measure of angle Q?

A. 37°

B. 53°

C. 127°

D. 143°

ID: 8027db3f

In triangle JKL, $\cos(K) = \frac{24}{51}$ and angle J is a right angle. What is the value of $\cos(L)$?

ID: 42b4493b

In a right triangle, the measure of one of the acute angles is 51°. What is the measure, in degrees, of the other acute angle?

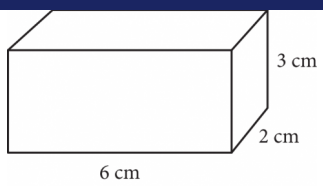
A. 6

B. 39

C. 49

D. 51

ID: d683a9cc



The figure shows the lengths, in centimeters (cm), of the edges of a right rectangular prism. The volume V of a right rectangular prism is ℓwh, where ℓ is the length of the prism, w is the width of the prism, and h is the height of the prism. What is the volume, in cubic centimeters, of the prism?

A. 36

B. 24

C. 12

D. 11

ID: a2e76b60

A cylindrical can containing pieces of fruit is filled to the top with syrup before being sealed. The base of the can has an area of $75\ cm^2$, and the height of the can is 10 cm. If $110\ cm^3$ of syrup is needed to fill the can to the top, which of the following is closest to the total volume of the pieces of fruit in the can?

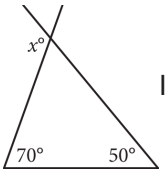
A. $7.5\ cm^3$

B. $185\ cm^3$

C. $640\ cm^3$

D. $750\ cm^3$

ID: 36200a38



In the figure above, two sides of a triangle are extended. What is the value of x ?

A. 110

B. 120

C. 130

D. 140

ID: 306264ab

A right triangle has sides of length $2\sqrt{2}$, $6\sqrt{2}$, and $\sqrt{80}$ units. What is the area of the triangle, in square units?

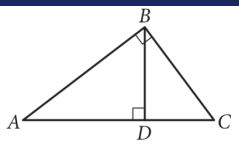
A. $8\sqrt{2} + \sqrt{80}$

B. 12

C. $24\sqrt{80}$

D. 24

ID: 6a3fbec3



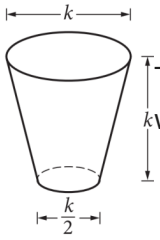
Note: Figure not drawn to scale.

In the figure above, $BD = 6$ and $AD = 8$.

What is the length of $\overline{DC}$?

ID: 37dde49f

Volume = $\frac{7\pi k^3}{48}$



The glass pictured above can hold a maximum volume of 473 cubic centimeters, which is approximately 16 fluid ounces. What is the value of *k*, in centimeters?

A. 2.52

B. 7.67

C. 7.79

D. 10.11

ID: 02b02213

What is the perimeter, in inches, of a rectangle with a length of 4 inches and a width of 9 inches?

A. 13

B. 17

C. 22

D. 26

ID: 82c8325f

A circle in the *xy*-plane has its center at $(-4, 5)$ and the point $(-8, 8)$ lies on the circle. Which equation represents this circle?

A. msup $+ (y + 5)^2 = 5$

B. msup $+ (y - 5)^2 = 5$

C. msup $+ (y + 5)^2 = 25$

D. msup $+ (y - 5)^2 = 25$

ID: 459dd6c5

Triangles ABC and DEF are similar. Each side length of triangle ABC is 4 times the corresponding side length of triangle DEF. The area of triangle ABC is 270 square inches. What is the area, in square inches, of triangle DEF?

ID: 25da87f8

A triangle with angle measures 30°, 60°, and 90° has a perimeter of $18+6\sqrt{3}$.

What is the length of the longest side of the triangle?

ID: 310c87fe

A cube has a surface area of 54 square meters. What is the volume, in cubic meters, of the cube?

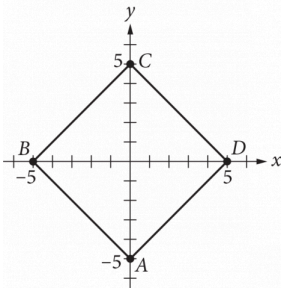
A. 18

B. 27

C. 36

D. 81

ID: cf53cb56



In the *xy*-plane shown, square *ABCD* has its diagonals on the *x*- and *y*-axes. What is the area, in square units, of the square?

A. 20

B. 25

C. 50

D. 100