Geometry Quick Quiz

December 19,2024

1

The line $-3x + 4y = 8$ is transformed by a dilation centered at the origin. Which linear equation could represent its image?

(1) $y = \frac{4}{3}x + 8$

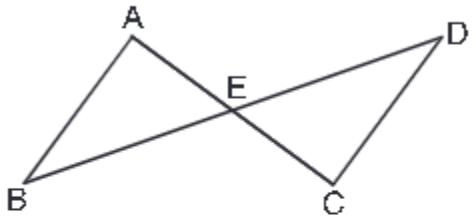
(2) $y = \frac{3}{4}x + 8$

(3) $y = -\frac{3}{4}x - 8$

(4) $y = -\frac{4}{3}x - 8$

2

In the diagram below, $\overline{AC}$ and $\overline{BD}$ intersect at E.



Which information is always sufficient to prove $\triangle ABE \cong \triangle CDE$?

(1) $\overline{AB} \parallel \overline{CD}$

(2) $\overline{AB} \cong \overline{CD}$ and $\overline{BE} \cong \overline{DE}$

(3) E is the midpoint of $\overline{AC}$.

(4) $\overline{BD}$ and $\overline{AC}$ bisect each other.

3.

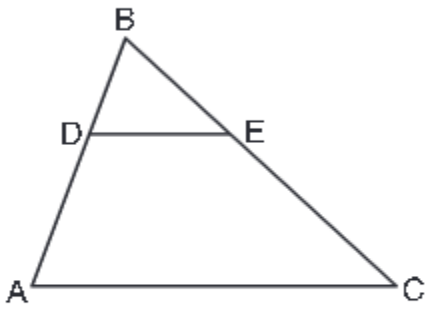
The expression $\sin 57°$ is equal to

(1) $\tan 33°$
(2) $\cos 33°$
(3) $\tan 57°$
(4) $\cos 57°$

Try to answer question 3 without a calculator.

4.

In the diagram below of $\triangle ABC$, D is a point on $\overline{BA}$, E is a point on $\overline{BC}$, and $\overline{DE}$ is drawn.



If $BD = 5$, $DA = 12$, and $BE = 7$, what is the length of $\overline{BC}$ so that $\overline{AC} \parallel \overline{DE}$?

(1) 23.8
(2) 16.8
(3) 15.6
(4) 8.6

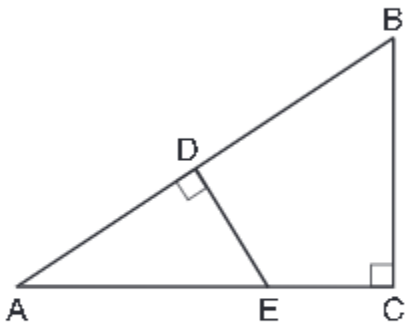
5.

A quadrilateral must be a parallelogram if

(1) one pair of sides is parallel and one pair of angles is congruent
(2) one pair of sides is congruent and one pair of angles is congruent
(3) one pair of sides is both parallel and congruent
(4) the diagonals are congruent

6.

In $\triangle ABC$ shown below, $\angle ACB$ is a right angle, E is a point on $\overline{AC}$, and $\overline{ED}$ is drawn perpendicular to hypotenuse $\overline{AB}$.



If $AB = 9$, $BC = 6$, and $DE = 4$, what is the length of $\overline{AE}$?

(1) 5

(2) 6

(3) 7

(4) 8

7.

Which equation represents a line parallel to the line whose equation is $-2x + 3y = -4$ and passes through the point (1,3)?

(1) $y - 3 = -\frac{3}{2}(x - 1)$

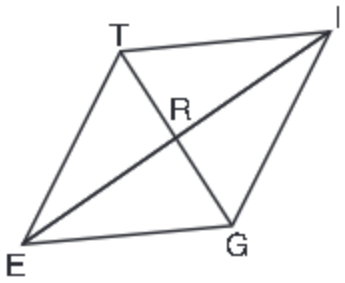
(2) $y - 3 = \frac{2}{3}(x - 1)$

(3) $y + 3 = -\frac{3}{2}(x + 1)$

(4) $y + 3 = \frac{2}{3}(x + 1)$

8.

In rhombus $TIGE$, diagonals $\overline{TG}$ and $\overline{IE}$ intersect at R. The perimeter of $TIGE$ is 68, and $TG = 16$.



What is the length of diagonal $\overline{IE}$?

(1) 15
(2) 30
(3) 34
(4) 52

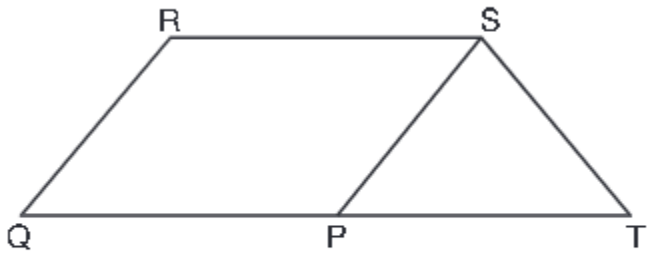
9.

The equation of a circle is $x^2 + 8x + y^2 - 12y = 144$. What are the coordinates of the center and the length of the radius of the circle?

(1) center $(4,-6)$ and radius 12
(2) center $(-4,6)$ and radius 12
(3) center $(4,-6)$ and radius 14
(4) center $(-4,6)$ and radius 14

10.

In parallelogram $PQRS$, $\overline{QP}$ is extended to point T and $\overline{ST}$ is drawn.



If $\overline{ST} \cong \overline{SP}$ and $m\angle R = 130°$, what is $m\angle PST$?

(1) 130°

(2) 80°

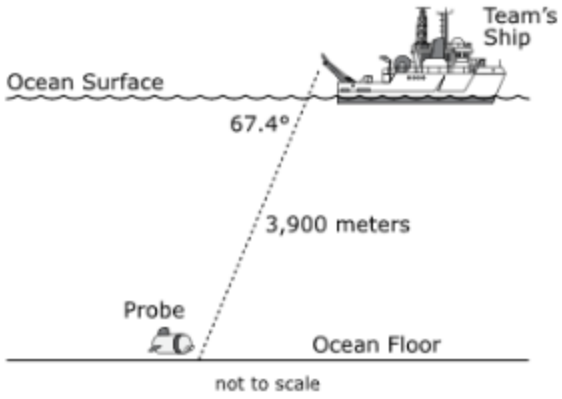
(3) 65°

(4) 50°

BONUS

11.

An archaeological team is excavating artifacts from a sunken merchant vessel on the ocean floor. To help with the exploration, the team uses a robotic probe. The probe travels approximately 3,900 meters at an angle of depression of 67.4 degrees from the team's ship on the ocean surface down to the sunken vessel on the ocean floor. The figure shows a representation of the team's ship and the probe.



Select from the drop-down menus to correctly complete the sentence.

When the probe reaches the ocean floor, the probe will be approximately Choose... 1,247 1,500 1,623 3,377 3,600 **meters below the ocean surface. When the probe reaches the ocean floor, the horizontal distance of the probe behind the team's ship on the ocean surface will be approximately**

Choose... 1,247 1,500 1,623 3,377 3,600 **meters.**

Converse, Inverse, Contrapositive

Given an if-then statement "if p, then q," we can create three related statements:

A conditional statement consists of two parts, a hypothesis in the "if" clause and a conclusion in the "then" clause. For instance, "If it rains, then they cancel school."
"It rains" is the hypothesis.
"They cancel school" is the conclusion.

To form the converse of the conditional statement, interchange the hypothesis and the conclusion.
The converse of *"If it rains, then they cancel school"* is *"If they cancel school, then it rains."*

To form the inverse of the conditional statement, take the negation of both the hypothesis and the conclusion.
The inverse of *"If it rains, then they cancel school"* is *"If it does not rain, then they do not cancel school."*

To form the contrapositive of the conditional statement, interchange the hypothesis and the conclusion of the inverse statement.
The contrapositive of *"If it rains, then they cancel school"* is *"If they do not cancel school, then it does not rain."*

Statement	If p, then q.
Converse	If q, then p.
Inverse	If not p, then not q.
Contrapositive	If not q, then not p.

Taken from:

https://www.varsitytutors.com/hotmath/hotmath_help/topics/converse-inverse-contrapositive

High School Mathematics Assessment Reference Sheet

1 inch = 2.54 centimeters
1 meter = 39.37 inches
1 mile = 5280 feet
1 mile = 1760 yards
1 mile = 1.609 kilometers

1 kilometer = 0.62 mile
1 pound = 16 ounces
1 pound = 0.454 kilograms
1 kilogram = 2.2 pounds
1 ton = 2000 pounds

1 cup = 8 fluid ounces
1 pint = 2 cups
1 quart = 2 pints
1 gallon = 4 quarts
1 gallon = 3.785 liters
1 liter = 0.264 gallons
1 liter = 1000 cubic centimeters

Triangle	$A = \frac{1}{2}bh$
Parallelogram	$A = bh$
Circle	$A = \pi r^2$
Circle	$C = \pi d \text{ or } C = 2\pi r$
General Prisms	$V = Bh$
Cylinder	$V = \pi r^2 h$
Sphere	$V = \frac{4}{3}\pi r^3$
Cone	$V = \frac{1}{3}\pi r^2 h$
Pyramid	$V = \frac{1}{3}Bh$

Quadratic Formula	$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
Arithmetic Sequence	$a_n = a_1 + (n-1)d$
Geometric Sequence	$a_n = a_1 r^{n-1}$
Geometric Series	$S_n = \frac{a_1 - a_1 r^n}{1-r}$ where $r \neq 1$
Radians	1 radian $= \frac{180}{\pi}$ degrees
Degrees	1 degree $= \frac{\pi}{180}$ radians