Name: key Class: _____ Date: _____ ID: A

Ch 4 Practice Test

Multiple Choice
Identify the choice that best completes the statement or answers the question.

a 1. Which of the following is not a Pythagorean triple?

(a.) 9, 11, 17
b. 7, 24, 25
c. 8, 15, 17
d. 3, 4, 5 ☺

$9^2 + 11^2 = 17^2$
$81 + 121 = 289$
$202 \neq 289$

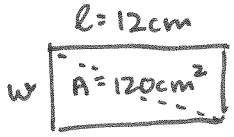
a 2. Each side of a square is 10 cm long. What is the length of the diagonal of the square?

(a.) 14.14 cm
b. 18.54 cm
c. 17.14 cm
d. 20.14 cm

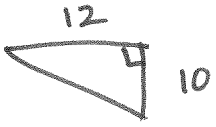
$a^2 + b^2 = c^2$
$10^2 + 10^2 = c^2$
$100 + 100 = c^2$
$200 = c^2$
$\sqrt{200} = c$
$14.14 \text{ cm} = c$

b 3. A rectangle has a length of 12 cm and an area of 120 cm^2. What is the length of the diagonal of the rectangle?

a. 17.62 cm
(b.) 15.62 cm
c. 120.60 cm
d. 119.40 cm



$A = \ell w$
$120 = (12)w$
$\frac{120}{12} = w$
$10 = w$



$a^2 + b^2 = c^2$
$10^2 + 12^2 = c^2$
$100 + 144 = c^2$
$244 = c^2$
$\sqrt{244} = c$
$15.62 = c$

d 4. What is the sine of 19°?

a. 0.946
b. 0.344
c. 0.360
(d.) 0.326

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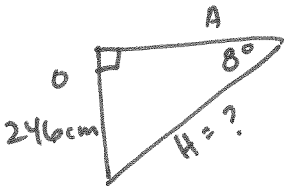
d 5. A right triangle has an angle of 8° and the opposite side is 246 cm. What is the length of the hypotenuse?

a. 248.42 cm
b. 1778.88 cm
c. 1750.38 cm
(d.) 1767.58 cm



$S = \frac{O}{H}$

$\sin 8° = \frac{246}{H}$

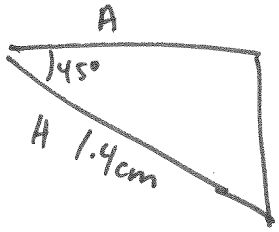
$H = \frac{246}{\sin 8°} = \frac{246}{0.1392} = 1767\text{cm}$

b 6. What is the cosine of 59°?

a. 0.857
(b.) 0.515
c. 1.664
d. 0.891

a 7. A right triangle has a hypotenuse of 1.4 cm. If one of the angles is 45°, what is the adjacent side?

(a.) 0.99 cm
b. 1.40 cm
c. ~~0.99~~ 1.36 cm
d. 2.2 cm



$C = \frac{A}{H}$

$\cos 45° = \frac{A}{1.4}$

$(\cos 45°)(1.4) = A$

$0.9899 = A$

c 8. The tangent ratio relates to which two sides of a right triangle?

a. The side adjacent to a given angle and the hypotenuse.
b. The side adjacent to a given angle and the vertical side.
(c.) The side opposite a given angle and the adjacent side.
d. The side opposite a given angle and the hypotenuse.

$T = \frac{O}{A}$

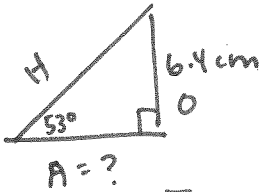
c 9. The tangent ratio is _____ as the angle increases from 0° to 90°.

a. Mostly increasing, sometimes decreasing
b. Mostly decreasing, sometimes increasing
(c.) Always increasing
d. Always decreasing

$10° = 0.1763$ $88° = 28.6$
$25° = 0.4663$
$63° = 1.963$

c 10. A right triangle has an angle of 53°. If the opposite side is 6.4 cm long, what is the length of the adjacent side?

a. 4.0 cm
b. 8.5 cm
(c.) 4.8 cm
d. 8.0 cm



$T = \frac{O}{A}$

$\tan 53° = \frac{6.4}{A}$

$A = \frac{6.4}{\tan 53°}$

$A = \frac{6.4}{1.327}$

$A = 4.82$

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a 11. Which side of a right triangle will be the longest if tan A is equal to 2?

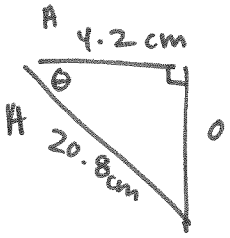
(a.) hypotenuse always the longest
b. opposite side
c. corresponding side
d. adjacent side

d 12. What is $\tan^{-1}(1.03)$?

a. 40.25°
b. 31.20°
c. 59.52°
(d.) 45.85°

c 13. The hypotenuse of a right triangle is 20.8 cm and one leg is 4.2 cm long. What is the angle adjacent to the 4.2 cm side?

a. 11.65°
b. 90.65°
(c.) 78.35°
d. 11.42°



$C = \frac{A}{H}$

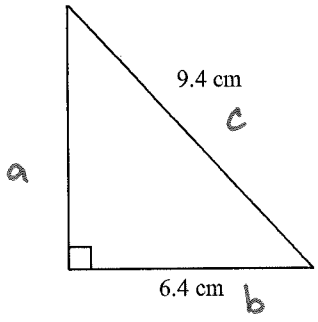
$C = \frac{4.2}{20.8}$

$C = 0.2019$

$\cos^{-1} 0.2019 = 78.35°$

Short Answer

1. Solve for the unknown side length.



$c^2 - b^2 = a^2$

$9.4^2 - 6.4^2 = a^2$

$88.36 - 40.96 = a^2$

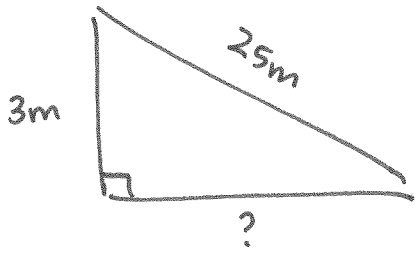
$47.4 = a^2$

$\sqrt{47.4} = a$

$6.88 = a$ cm

2. A right triangle with a hypotenuse of 25 m must have legs that are at least 3 m in length. What is the maximum length that either of the legs can be?

minimum
maximum



$c^2 - b^2 = a^2$

$25^2 - 3^2 = a^2$

$625 - 9 = a^2$

$616 = a^2$

$\sqrt{616} = a$

$24.8\text{m} = a$

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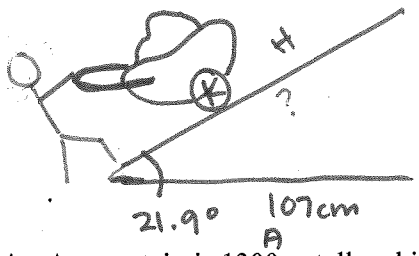
Weirdly worded...

3. A worker uses a board to create a temporary ramp for his wheelbarrow. If the board covers a horizontal distance of 107 cm and has an angle of elevation of 21.9°, how long is the board, in metres?

$107\text{ cm} \times \frac{1\text{ m}}{100\text{ cm}} = 1.7\text{ m}$ *

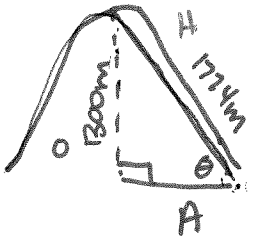


$C = \frac{A}{H}$

$\cos 21.9 = \frac{107}{H}$

$H = \frac{107}{\cos 21.9} = \frac{107}{0.9278} = 115.3\text{ cm}$

4. A mountain is 1300 m tall and its peak is 1774 m up the side of the hill. At what angle does the mountain rise?

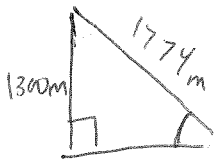


$S = \frac{O}{H}$

$S = \frac{1300}{1774}$

$S = 0.7328$

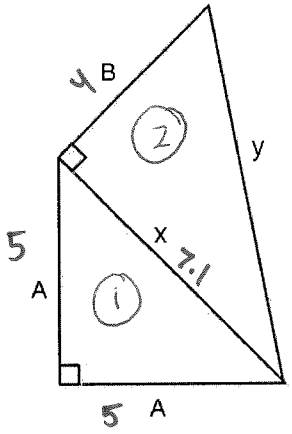
$\sin^{-1} 0.7328 = 47.12°$



Problem

1. The diagram below has the following dimensions:
   A = 5 cm
   B = 4 cm

   Find the length of *y*.



① $a^2 + b^2 = c^2$

$5^2 + 5^2 = c^2$

$25 + 25 = c^2$

$50 = c^2$

$\sqrt{50} = c$

$7.1 = c$

② $a^2 + b^2 = c^2$

$4^2 + 7.1^2 = c^2$

$16 + 50.41 = c^2$

$66.41 = c^2$

$\sqrt{66.41} = c$

$8.15 = c$

FINAL

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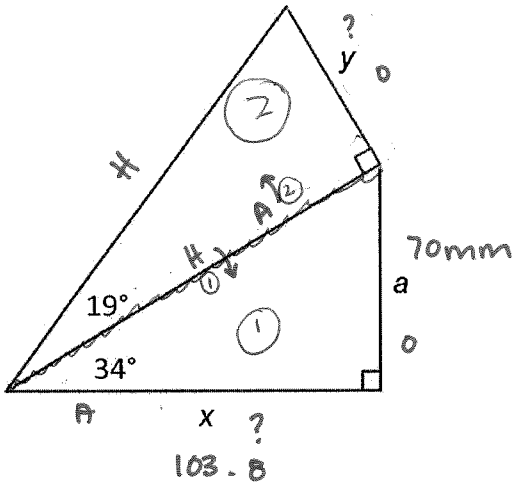
2. If a is 70 mm, find the values of x and y to 1 decimal place.



① x:

$T = \frac{O}{A}$

$\tan 34° = \frac{70}{A}$

$A = \frac{70}{\tan 34°}$

$A = \frac{70}{0.6745}$

$A = 103.8$ mm. ← x

② $a^2 + b^2 = c^2$

$70^2 + 103.8^2 = c^2$

$4900 + 10774.44 = c^2$

$15\,674.44 = c^2$

$\sqrt{\quad} = c$

$125.2 = c$

OR

② $S = \frac{O}{H}$

$\sin 34° = \frac{70}{H}$

$H = \frac{70}{\sin 34°}$

$H = \frac{70}{0.5592}$

$H = 125.2$

③ y:

$T = \frac{O}{A}$

$\tan 19° = \frac{O}{125.2}$

$(\tan 19°)(125.2) = O$

$43.1 = O$ mm. ← y