Math 1316 - Practice Exam 1 - Spring 19

MULTIPLE CHOICE SECTION. (5 pts each) Choose the correct answer for each question. Select one choice only. No work will be graded. No partial credit.

Find the measure of each angle in the problem.

1) Complementary angles with measures 3x and 6x – 18 degrees 1) _____

A) 12° and 78° B) 38° and 52° C) 66° and 114° D) 36° and 54°

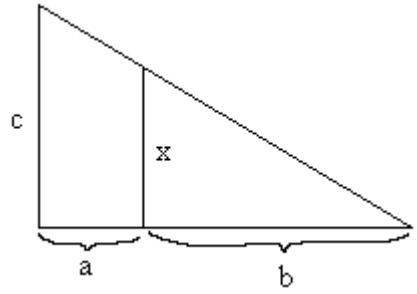
Find the measure of the third angle of a triangle if the measures of the other two angles are given.

2) 102.5° and 42.4° 2) _____

A) 45.1° B) 215.1° C) 55.1° D) 35.1°

The triangles are similar. Find the missing side, angle or value of the variable.

3) x 3) _____



a = 25
b = 75
c = 52

A) x = 26 B) x = 39 C) x = 52 D) x = 13

An equation of the terminal side of an angle θ in standard position is given along with a restriction on x. Find the indicated trigonometric function value of θ. Do not use a calculator.

4) –2x – 5y = 0, x ≤ 0; Find sec θ. 4) _____

A) $-\frac{2}{5}$ B) $-\frac{5}{2}$ C) $-\frac{5\sqrt{29}}{29}$ D) $-\frac{\sqrt{29}}{5}$

Use the appropriate identity to find the indicated function value. Rationalize the denominator, if applicable. If the given value is a decimal, round your answer to three decimal places.

5) tan θ, given that cot $\theta = -\frac{10}{11}$ 5) _____

A) $\frac{11}{10}$ B) $\frac{21}{11}$ C) $-\frac{11}{10}$ D) $-\frac{10}{11}$

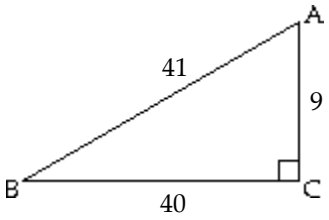
Identify the quadrant for the angle θ satisfying the following conditions.

6) csc θ > 0 and sec θ > 0 6) _____

A) Quadrant IV B) Quadrant III C) Quadrant II D) Quadrant I

Evaluate the function requested. Write your answer as a fraction in lowest terms.

7) 7) _____



Find cos B.

A) $\cos B = \frac{9}{40}$ B) $\cos B = \frac{9}{41}$ C) $\cos B = \frac{40}{41}$ D) $\cos B = \frac{41}{40}$

Find a solution for the equation. Assume that all angles are acute angles.

8) $\sec(\theta + 12°) = \csc(2\theta + 15°)$ 8) _____

A) 23.5° B) 15° C) 19° D) 21°

Find the reference angle for the given angle.

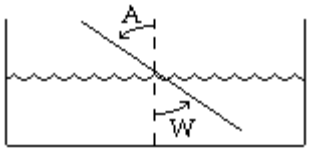
9) –403° 9) _____

A) 137° B) 43° C) 47° D) 133°

Solve the problem.

10) The index of refraction for air, I_a, is 1.0003. The index of refraction for water, I_W, is 1.3. If 10) _____

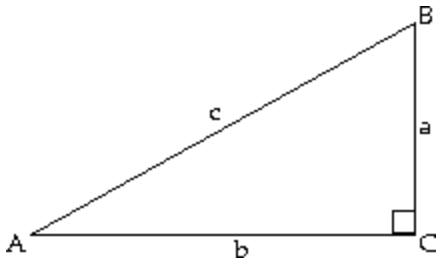
$\frac{I_W}{I_a} = \frac{\sin A}{\sin W}$, and A = 31.5°, find W to the nearest tenth.



A) 20.7° B) 21.7° C) 23.7° D) 22.7°

Solve the right triangle.

11) 11) _____



A = 41.3°, b = 2.5 m

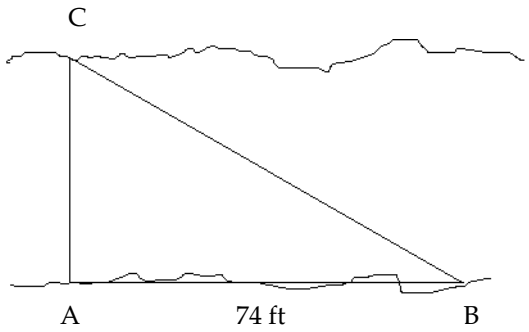
Round side lengths to one decimal place.

A) B = 48.7°; a = 2.2 m; c = 3.3 m B) B = 48.7°; a = 4.0 m; c = 4.7 m

C) B = 48.7°; a = 1.1 m; c = 4.0 m D) B = 48.7°; a = 1.1 m; c = 2.7 m

Solve the problem.

12) To measure the width of a river, a surveyor starts at point A on one bank and walks 74 feet down the river to point B. He then measures the angle ABC to be 25°36'14". Estimate the width of the rive to the nearest foot. See the figure below. 12) _____



A) 35 ft B) 67 ft C) 154 ft D) 32 ft

SHORT ANSWER SECTION. (5 pts each) Write the answer in the box. Write the FINAL ANSWER ONLY. No work will be graded. No partial credit.

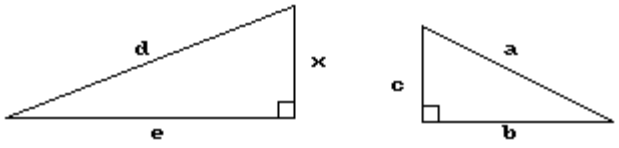
Find the angle of least positive measure coterminal with the given angle.

13) 1280° 13) _____

Answer ONLY:

The triangles are similar. Find the missing side, angle or value of the variable.

14) 14) _____



a = 13
b = 12
c = 5
d = 26
e = 24

Answer ONLY:

Use the fundamental identities to find the value of the trigonometric function.

15) Find cot θ, given that $\csc \theta = -\frac{3}{2}$ and θ is in quadrant III. 15) _____

Answer ONLY:

Suppose ABC is a right triangle with sides of lengths a, b, and c and right angle at C. Find the unknown side length using the Pythagorean theorem and then find the value of the indicated trigonometric function of the given angle. Rationalize the denominator if applicable.

16) Find tan B when b = 8 and c = 9. 16) _____

Answer ONLY:

Evaluate.

17) $5 \sin^2 300° + \csc^2 150° - \sec^2 30°$ 17) _____

Answer ONLY (give the EXACT answer, i.e., no decimal approximation):

Solve the problem.

18) Snell's Law states that $\frac{c_1}{c_2} = \frac{\sin \theta_1}{\sin \theta_2}$. Use this law to find the requested value. If 18) _____

$c_1 = 6 \times 10^8$, $c_2 = 4.66 \times 10^8$, $\theta_1 = 43°$, find θ_2. Round your answer to the nearest degree.

Answer ONLY:

ESSAY. (5 pts each) Show all work to justify your answer. Answer with no work or insufficient work will receive no credit. Partial credit may be given.

19) A 37–foot ladder is leaning against the side of a building. If the ladder makes an angle of 24° 16′ with the side of the building, how far up from the ground does the ladder make contact with the building? Round your answer to the hundredths place when necessary.

Solution (Show all work):

Use the fundamental identities to find the value of the trigonometric function.

20) Find csc θ, given that $\cot \theta = -\frac{7}{2}$ and $\cos \theta < 0$.

Solution (Show all work):

1) D
2) D
3) B
4) D
5) C
6) D
7) C
8) D
9) B
10) C
11) A
12) A
13) 200°
14) x = 10
15) $\frac{\sqrt{5}}{2}$
16) $\frac{8\sqrt{17}}{17}$
17) $\frac{77}{12}$
18) $\theta_2 = 32°$
19) 33.73 ft
20) $\frac{\sqrt{53}}{2}$