TEAM MEMBER #1

Select the letter of the most appropriate answer and shade in the corresponding region on the answer sheet.

1) A building 180 feet tall casts a 70 foot long shadow. If a person stands at the end of the shadow and looks up to the top of the building, what is the angle of the person's eyes to the top of the building (to the nearest hundredth of a degree)? (Assume the person's eyes are 4 feet above ground level.)

A) 23.44° B) 66.56° C) 68.75° D) 68.31°

θ is an acute angle and sin θ and cos θ are given. Use identities to find the indicated value.

2) $\sin\theta = \frac{2}{7}$, $\cos\theta = \frac{3\sqrt{5}}{7}$. Find csc θ.

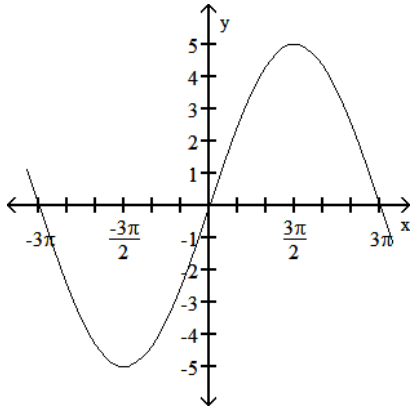
A) $\frac{2\sqrt{5}}{15}$ B) $\frac{3\sqrt{5}}{2}$ C) $\frac{7\sqrt{5}}{15}$ D) $\frac{7}{2}$

3) From a boat on the river below a dam, the angle of elevation to the top of the dam is 32°46'. If the dam is 1312 feet above the level of the river, how far is the boat from the base of the dam (to the nearest foot)?

A) 2028 feet B) 2038 feet C) 2018 feet D) 2008 feet

Find an equation for the graph.

4)



A) $y = 5\sin\frac{1}{3}x$ B) $y = 3\sin\frac{1}{5}x$ C) $y = 3\sin 5x$ D) $y = 5\sin 3x$

Complete the identity.

5) $\frac{(\sin x + \cos x)^2}{1 + 2\sin x\cos x} = ?$

A) 1 B) $-\sec^2 x$ C) $1 - \sin x$ D) 0

Rewrite the expression in terms of the given function or functions.

6) $(\sec x + \csc x)(\sin x + \cos x) - 2 - \cot x$; $\tan x$

A) 0 B) $2 + \tan x$ C) $2\tan x$ D) $\tan x$

Solve the right triangle ABC with right angle C . Round lengths to one decimal place and express angles to the nearest tenth of a degree.

7) A = 38°, b = 42.9

A) B = 38°, a = 54.9, c = 33.8 B) B = 52°, a = 33.5, c = 54.4

C) B = 52°, a = 54.9, c = 69.7 D) B = 38°, a = 33.8, c = 33.5

TEAM MEMBER #2

Select the letter of the most appropriate answer and shade in the corresponding region on the answer sheet.

8) A radio transmission tower is 100 feet tall. How long should a guy wire be if it is to be attached 10 feet from the top and is to make an angle of 20° with the ground? Give your answer to the nearest tenth of a foot.

A) 292.4 feet B) 95.8 feet C) 106.4 feet D) 263.1 feet

θ is an acute angle and sin θ and cos θ are given. Use identities to find the indicated value.

9) $\sin\theta = \frac{3}{7}$, $\cos\theta = \frac{2\sqrt{10}}{7}$. Find $\tan\theta$.

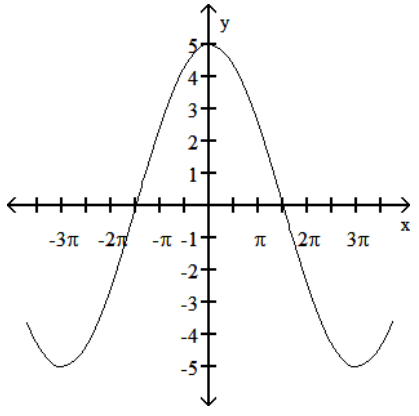
A) $\frac{3\sqrt{10}}{3}$ B) $\frac{3\sqrt{10}}{20}$ C) $\frac{7\sqrt{10}}{20}$ D) $\frac{7}{3}$

10) From a boat on the lake, the angle of elevation to the top of a cliff is 15°41'. If the base of the cliff is 2573 feet from the boat, how high is the cliff (to the nearest foot)?

A) 722 feet B) 725 feet C) 735 feet D) 732 feet

Find an equation for the graph.

11)



A) $y = 5\cos 3x$ B) $y = 5\cos\frac{1}{3}x$ C) $y = 3\cos\frac{1}{5}x$ D) $y = 3\cos 5x$

Complete the identity.

12) $\frac{\sin x}{\cos x} + \frac{\cos x}{\sin x} = ?$

A) $\sin x \tan x$ B) $\sec x \csc x$ C) $1 + \cot x$ D) $-2\tan^2 x$

Rewrite the expression in terms of the given function or functions.

13) $\cos^2 x + \cos x - 1 + \sin^2 x$; $\cos x$

A) $2\cos x$ B) $-\cos x$ C) $2 + \cos x$ D) $\cos x$

Solve the right triangle ABC with right angle C . Round lengths to one decimal place and express angles to the nearest tenth of a degree.

14) A = 50.2°, c = 55.4

A) B = 50.2°, a = 35.5, b = 42.6 B) B = 39.8°, a = 35.5, b = 42.6

C) B = 39.8°, a = 42.6, b = 35.5 D) B = 50.2°, a = 42.6, b = 35.5

TEAM MEMBER #3

Select the letter of the most appropriate answer and shade in the corresponding region on the answer sheet.

15) A straight trail with a uniform inclination of 18° leads from a lodge at an elevation of 900 feet to a mountain lake at an elevation of 8000 feet. What is the length of the trail (to the nearest foot)?

A) 8412 feet B) 25,889 feet C) 22,976 feet D) 7465 feet

θ is an acute angle and sin θ and cos θ are given. Use identities to find the indicated value.

16) $\sin\theta = \frac{\sqrt{11}}{6}$, $\cos\theta = \frac{5}{6}$. Find sec θ.

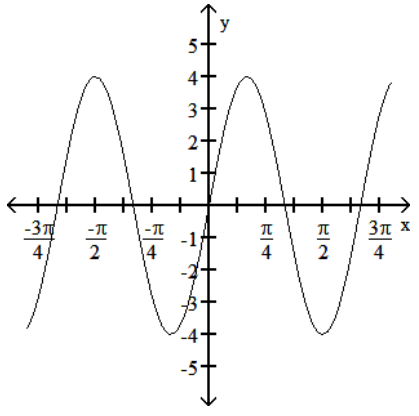
A) $\frac{6}{5}$ B) $\frac{6\sqrt{11}}{11}$ C) $\frac{\sqrt{11}}{5}$ D) $\frac{5\sqrt{11}}{11}$

17) A radio transmission tower is 240 feet tall. How long should a guy wire be if it is to be attached 5 feet from the top and is to make an angle of 35° with the ground? Give your answer to the nearest tenth of a foot.

A) 286.9 feet B) 293.0 feet C) 418.4 feet D) 409.7 feet

Find an equation for the graph.

18)



A) $y = 4\sin\frac{1}{3}x$ B) $y = 3\sin\frac{1}{4}x$ C) $y = 3\sin 4x$ D) $y = 4\sin 3x$

Complete the identity.

19) $\csc x(\sin x + \cos x) = ?$

A) $-2\tan^2 x$ B) $\sec x \csc x$ C) $\sin x \tan x$ D) $1 + \cot x$

Rewrite the expression in terms of the given function or functions.

20) $\csc x + \tan^2 x \csc x$; $\cos x$ and $\sin x$

A) $\frac{1}{\sin x \cos x}$ B) $\cos x - \sin x$ C) $\frac{1}{\sin x \cos^2 x}$ D) $\frac{\sin x + \cos x}{\sin x \cos x}$

Solve the right triangle ABC with right angle C . Round lengths to one decimal place and express angles to the nearest tenth of a degree.

21) B = 39°, b = 42.1

A) A = 39°, a = 34.1, c = 32.7 B) A = 51°, a = 52, c = 66.9

C) A = 39°, a = 34.1, c = 66.9 D) A = 51°, a = 52, c = 54.2

TEAM MEMBER #4

Select the letter of the most appropriate answer and shade in the corresponding region on the answer sheet.

22) A building 220 feet tall casts a 90 foot long shadow. If a person looks down from the top of the building, what is the measure of the angle between the end of the shadow and the vertical side of the building (to the nearest degree)? (Assume the person's eyes are level with the top of the building.)

A) 22° B) 24° C) 68° D) 66°

θ is an acute angle and sin θ and cos θ are given. Use identities to find the indicated value.

23) $\sin\theta = -\frac{\sqrt{5}}{3}$, $\cos\theta = \frac{2}{3}$. Find $\cot\theta$.

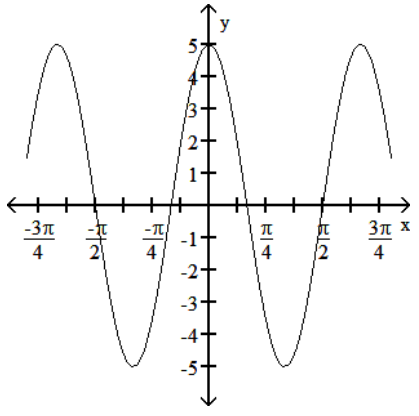
A) $\frac{3}{2}$ B) $\frac{-2\sqrt{5}}{5}$ C) $\frac{-3\sqrt{5}}{5}$ D) $\frac{\sqrt{5}}{2}$

24) A straight trail with a uniform inclination of 15° leads from a lodge at an elevation of 500 feet to a mountain lake at an elevation of 9600 feet. What is the length of the trail (to the nearest foot)?

A) 37,092 feet B) 35,160 feet C) 9421 feet D) 9939 feet

Find an equation for the graph.

25)



A) $y = 5\cos\frac{1}{3}x$ B) $y = 3\cos\frac{1}{5}x$ C) $y = 3\cos 5x$ D) $y = 5\cos 3x$

Complete the identity.

26) $\sec x - \frac{1}{\sec x} = ?$

A) $1 + \cot x$ B) $\sin x \tan x$ C) $-2\tan^2 x$ D) $\sec x \csc x$

Rewrite the expression in terms of the given function or functions.

27) $(\sec x + \csc x)(\sin x + \cos x) - 2 - \tan x$; $\cot x$

A) 0 B) $2 + \cot x$ C) $2\cot x$ D) $\cot x$

Solve the right triangle ABC with right angle C . Round lengths to one decimal place and express angles to the nearest tenth of a degree.

28) b = 220, c = 350

A) A = 32.2°, B = 57.8°, a = 272.2 B) A = 51.1°, B = 38.9°, a = 413.4

C) A = 51.1°, B = 38.9°, a = 272.2 D) A = 57.8°, B = 32.2°, a = 413.4

Answer Key
Testname: RELAYS 16 (TRIG TEAM)

1) D
2) D
3) B
4) A
5) A
6) D
7) B
8) D
9) B
10) A
11) B
12) B
13) D
14) C
15) C
16) A
17) D
18) D
19) D
20) C
21) B
22) A
23) B
24) B
25) D
26) B
27) D
28) C