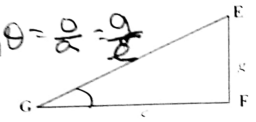
Key

AFM Unit 3 Test Review

Name: _____ Date: _____

1. What is the tangent of $\angle G$ in the triangle below?

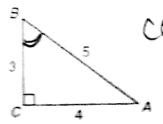
$\tan\theta = \frac{o}{a} = \frac{9}{8}$



A. $\frac{8}{9}$ B. $\frac{9}{8}$ C. $\frac{8}{5}$ D. $\frac{5}{8}$

2. Triangle ABC is shown below.

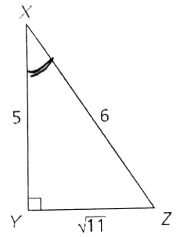
$\cos\theta = \frac{a}{h}$



What is the cosine of angle B?

A. $\frac{3}{5}$ B. $\frac{4}{5}$ C. $\frac{5}{4}$ D. $\frac{5}{3}$

3. Study the triangle below.

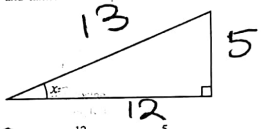


What is the cosine of $\angle X$?

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

$\frac{a}{h}$

4. In the figure below, if $\sin x = \frac{5}{13}$, what are $\cos x$ and $\tan x$?



A. $\cos x = \frac{12}{13}$ and $\tan x = \frac{5}{12}$

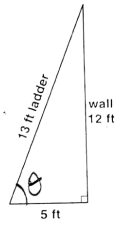
B. $\cos x = \frac{12}{13}$ and $\tan x = \frac{12}{5}$

C. $\cos x = \frac{13}{12}$ and $\tan x = \frac{5}{12}$

D. $\cos x = \frac{13}{12}$ and $\tan x = \frac{13}{5}$

$5^2 + a^2 = 13^2$
-5^2
$a^2 = 144$
$a = 12$

5. A 13-foot ladder is leaning against a brick wall. The top of the ladder touches the wall 12 feet (ft) above the ground. The bottom of the ladder is 5 ft from the bottom of the wall. What is the sine of the angle formed by the ground and the base of the ladder?

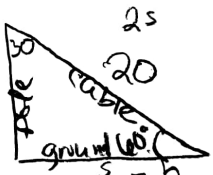


A. $\frac{5}{12}$ B. $\frac{5}{13}$ C. $\frac{12}{13}$ D. $\frac{13}{5}$

6. A 20 meter long cable is used to support a telephone pole, holding it perpendicular to the ground. If the cable forms a 60° angle with the ground, how high up the pole should the cable be attached?

A. 10 meters B. $10\sqrt{3}$ meters

C. $20\sqrt{2}$ meters D. $20\sqrt{3}$ meters



$s\sqrt{3}$

$\frac{s\sqrt{3}}{\sqrt{3}} = \frac{h}{\sqrt{3}}$ h

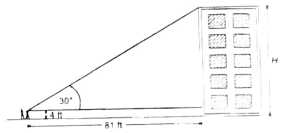
$s = \frac{h}{\sqrt{3}}$

$2\left(\frac{h}{\sqrt{3}}\right) = 20$

$\frac{2h}{\sqrt{3}} = 20\sqrt{3} \rightarrow \frac{2h}{2} = \frac{20\sqrt{3}}{2}$

$h = 10\sqrt{3}$

7. In Dewey Beach, building codes restrict the height of building to 50 feet. Study the diagram, then determine by how much the building shown is above or below the code restriction.



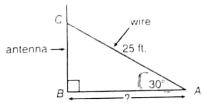
$\tan 30 = \frac{h}{81}$ · 81

$h = 46.77 + 4$

$h = 50.768$ ft

over by 0.768

8. A 25-foot wire attached to an antenna makes a 30° angle with the level ground, as shown below.



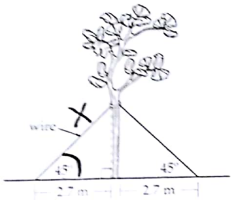
What is the approximate distance from the base of the antenna to the place where the wire is staked to the ground?

A. 22 ft. B. 18 ft. C. 13 ft. D. 28 ft.

$25\cos 30 = \frac{x}{25}$ · 25

$x = 21.65$ ft

9. Two wires support a young tree as shown below.



Note: The figure is not drawn to scale.

What is the length, in meters, of each wire?

$\cos 45 = \frac{2.7}{x}$

$x = 3.82\text{m}$

10. In $\triangle ABC$, $a = 15$, $c = 10$, and $\sin A = 0.45$. Find $\sin C$.

$\frac{\sin A}{a} = \frac{\sin C}{c}$

$\frac{15\sin C}{15} = \frac{4.5}{15} = \frac{0.45}{15} = \frac{\sin C}{10}$

$\boxed{\sin C = .3}$

11. If $a = 4$, $b = 6$, and $\sin A = \frac{3}{5}$ in $\triangle ABC$, then $\sin B$ equals

A. $\frac{3}{20}$ B. $\frac{4}{20}$ C. $\frac{6}{20}$ D. $\frac{9}{20}$

$\frac{\sin A}{a} = \frac{\sin B}{b}$

$\frac{.6}{4} = \frac{\sin B}{6}$

$\frac{4\sin B}{4} = \frac{3.6}{4}$

$\boxed{\sin B = .9}$

12. If $a = 6$, $b = 5$, and $m\angle A = 30$, the number of distinct triangles which can be constructed is

A. 1 B. 2 C. 3 D. 0

SKIP

13. If $m\angle A = 40$, $a = 6$, and $b = 8$, how many distinct triangles can be constructed?

SKIP

14. If $m\angle A = 30$, $a = \sqrt{5}$, and $b = 6$, the number of triangles that can be constructed

A. 1 B. 2

C. 3 D. an infinite number

SKIP

15. In $\triangle ABC$, $a = 6$, $b = 10$, and $m\angle C = 120$. What is the length of c?

$c^2 = 6^2 + 10^2 - 2(6)(10)\cos(120)$

$c^2 = 196$

$\boxed{c = 14}$

16. In $\triangle ABC$, $a = 1$, $b = 1$, and $m\angle C = 120$. The value of c is

A. 1 B. $\sqrt{2}$ C. $\sqrt{2.5}$ D. $\sqrt{3}$

$c^2 = 1^2 + 1^2 - 2(1)(1)\cos(120)$

$c^2 = 3$

$c = \sqrt{3}$

17. The area of $\triangle ABC$ is 100 square centimeters. If $c = 20$ centimeters and $m\angle A = 30$, then b is equal to

A. 20 cm B. 500 cm

C. $20\sqrt{3}$ cm D. $10\sqrt{2}$ cm

$A = \frac{1}{2}ab\sin C$

$100 = \frac{1}{2}(20)b\sin(30)$

$100 = \frac{10b\sin(30)}{10\sin(30)}$

$20 = b$

18. In $\triangle ABC$, $a = 8$ and $b = 8$. If the area of $\triangle ABC$ is 16, find $m\angle C$.

$16 = \frac{1}{2}(8)(8)\sin C$

$\frac{16}{32} = \frac{32\sin C}{32}$

$\frac{1}{2} = \sin C$

$\sin^{-1}(\frac{1}{2}) = C$

$C = 30°$

19. Find the length of side x.

A. 10 B. 12

C. 14 D. 194

20. In $\triangle ABC$, $AC = 10$, $BC = 8$, $m\angle B = 90°$ and $m\angle BDA = 90°$. How long is $\overline{CD}$?

A. 3.6 B. 4

C. 5 D. 6.4

$8^2 + (AB)^2 = 10^2$

$-8^2 \quad -8^2$

$(AB)^2 = 36$

$AB = 6$

$6^2 = (10-x)^2 + y^2$

$36 = 100 - 20x + x^2 + y^2$

$-100 \quad +20x - x^2$

$\sqrt{-64 + 20x - x^2} = \sqrt{y^2}$

$y = \sqrt{-64 + 20x - x^2}$

$x^2 + (\sqrt{-64 + 20x - x^2})^2 = 8^2$

$\cancel{x^2} + \cancel{-64} + 20x - \cancel{x^2} = 64$

$+64 \quad +64$

$\frac{20x}{20} = \frac{128}{20}$

$x = 6.4$