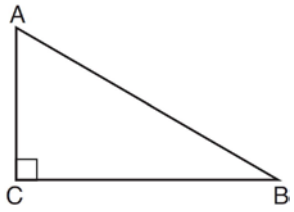
Name: _____

G.SRT.C.7: Cofunctions

1 In scalene triangle ABC shown in the diagram below, $m\angle C = 90°$.



Which equation is always true?
1) $\sin A = \sin B$
2) $\cos A = \cos B$
3) $\cos A = \sin C$
4) $\sin A = \cos B$

2 In $\triangle ABC$, the complement of $\angle B$ is $\angle A$. Which statement is always true?
1) $\tan\angle A = \tan\angle B$
2) $\sin\angle A = \sin\angle B$
3) $\cos\angle A = \tan\angle B$
4) $\sin\angle A = \cos\angle B$

3 Which expression is always equivalent to $\sin x$ when $0° < x < 90°$?
1) $\cos(90° - x)$
2) $\cos(45° - x)$
3) $\cos(2x)$
4) $\cos x$

4 In right triangle ABC, $m\angle C = 90°$. If $\cos B = \frac{5}{13}$, which function also equals $\frac{5}{13}$?
1) $\tan A$
2) $\tan B$
3) $\sin A$
4) $\sin B$

5 In $\triangle ABC$, where $\angle C$ is a right angle, $\cos A = \frac{\sqrt{21}}{5}$. What is $\sin B$?
1) $\frac{\sqrt{21}}{5}$
2) $\frac{\sqrt{21}}{2}$
3) $\frac{2}{5}$
4) $\frac{5}{\sqrt{21}}$

6 If $\sin 6A = \cos 9A$, then $m\angle A$ is equal to
1) 6
2) 36
3) 45
4) $1\frac{1}{2}$

7 If $\sin 2A = \cos 3A$, then $m\angle A$ is
1) $1\frac{1}{2}$
2) 5
3) 18
4) 36

8 If $\sin(A - 30)° = \cos 60°$, the number of degrees in the measure of angle A is
1) 30
2) 60
3) 90
4) 120

9 Which is a value of x if $\sin 60° = \cos(x + 10)°$?
1) 10°
2) 20°
3) 50°
4) 60°

Name: _____

10 If $\cos(x + 30°) = \sin x$, a measure of angle x is
1) 15º
2) 30º
3) 45º
4) 60º

11 If $\sin(x + 20°) = \cos x$, the value of x is
1) 35º
2) 45º
3) 55º
4) 70º

12 In a right triangle, $\sin(40 - x)° = \cos(3x)°$. What is the value of x?
1) 10
2) 15
3) 20
4) 25

13 If $\cos(2x - 1)° = \sin(3x + 6)°$, then the value of x is
1) –7
2) 17
3) 35
4) 71

14 If $\sin(x - 3)° = \cos(2x + 6)°$, then the value of x is
1) –9
2) 26
3) 29
4) 64

15 Which value of x satisfies the equation $\sin(3x + 5)° = \cos(4x + 1)°$?
1) 30
2) 24
3) 12
4) 4

16 If $\cos 72° = \sin x$, find the number of degrees in the measure of acute angle x.

17 Find the value of R that will make the equation $\sin 73° = \cos R$ true when $0° < R < 90°$. Explain your answer.

18 If $3x$ is the measure of a positive acute angle and $\cos 3x = \sin 60°$, find the value of x.

19 If x is a positive acute angle and $\sin x = \cos(x + 20°)$, find the value of x.

20 If $\cos(2x - 25)° = \sin 55°$, find the value of x.

21 If $\sin(2x + 20)° = \cos 40°$, find x.

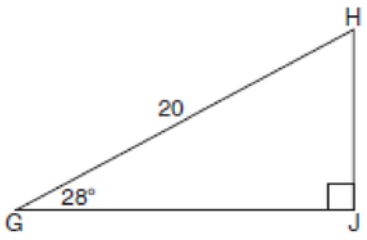
22 Find the value of acute angle A if $\frac{\sin A}{\cos 50°} = 1$.

23 In right triangle ABC with the right angle at C, $\sin A = 2x + 0.1$ and $\cos B = 4x - 0.7$. Determine and state the value of x. Explain your answer.

24 Explain why $\cos(x) = \sin(90 - x)$ for x such that $0 < x < 90$.

25 Given: Right triangle ABC with right angle at C. If $\sin A$ increases, does $\cos B$ increase or decrease? Explain why.

26 When instructed to find the length of $\overline{HJ}$ in right triangle HJG, Alex wrote the equation $\sin 28° = \frac{HJ}{20}$ while Marlene wrote $\cos 62° = \frac{HJ}{20}$. Are both students' equations correct? Explain why.



G.SRT.C.7: Cofunctions
Answer Section

1 ANS: 4 REF: 061512geo
2 ANS: 4 REF: 011609geo
3 ANS: 1 REF: 081504geo
4 ANS: 3 REF: 061703geo
5 ANS: 1 REF: 081606geo
6 ANS: 1
$6A + 9A = 90$. As originally written, distractor (3) was $A = 54$, also a correct response.

$$15A = 90$$
$$A = 6$$

REF: 010320b
7 ANS: 3
$2A + 3A = 90$

$$5A = 90$$
$$A = 18$$

REF: 069621siii
8 ANS: 2
$A - 30 + 60 = 90$

$$A = 60$$

REF: 068025siii
9 ANS: 2
$60 + x + 10 = 90$

$$x = 20$$

REF: 068717siii
10 ANS: 2
$x + 30 + x = 90$

$$2x = 60$$
$$x = 30$$

REF: 088622siii
11 ANS: 1
$x + 20 + x = 90$

$$2x = 70$$
$$x = 35$$

REF: 019729siii

12 ANS: 4

$40 - x + 3x = 90$

$2x = 50$

$x = 25$

REF: 081721geo

13 ANS: 2

$2x - 1 + 3x + 6 = 90$

$5x = 85$

$x = 17$

REF: 089633siii

14 ANS: 3

$x - 3 + 2x + 6 = 90$

$3x = 87$

$x = 29$

REF: 069825siii

15 ANS: 3

$3x + 5 + 4x + 1 = 90$

$7x = 84$

$x = 12$

REF: 019428siii

16 ANS:

$72 + x = 90$

$x = 18$

REF: 089704siii

17 ANS:

$73 + R = 90$ Equal cofunctions are complementary.

$R = 17$

REF: 061628geo

18 ANS:

$3x + 60 = 90$

$3x = 30$

$x = 10$

REF: 010404siii

19 ANS:
$x + x + 20 = 90$

$2x = 70$

$x = 35$

REF: 088415siii

20 ANS:
$2x - 25 + 55 = 90$

$2x = 60$

$x = 30$

REF: 069912siii

21 ANS:
$2x + 20 + 40 = 90$

$2x = 30$

$x = 15$

REF: 060310siii

22 ANS:
$\sin A = \cos 50$

$A + 50 = 90$

$A = 40$

REF: 018712siii

23 ANS:
$4x - .07 = 2x + .01$ Sin$A$ is the ratio of the opposite side and the hypotenuse while $\cos B$ is the ratio of the adjacent

$2x = 0.8$

$x = 0.4$

side and the hypotenuse. The side opposite angle A is the same side as the side adjacent to angle B. Therefore, $\sin A = \cos B$.

REF: fall1407geo

24 ANS:
The acute angles in a right triangle are always complementary. The sine of any acute angle is equal to the cosine of its complement.

REF: spr1407geo

25 ANS:
$\cos B$ increases because $\angle A$ and $\angle B$ are complementary and $\sin A = \cos B$.

REF: 011827geo

26 ANS:
Yes, because 28º and 62º angles are complementary. The sine of an angle equals the cosine of its complement.

REF: 011727geo