

Houston Community College  
Plane Trigonometry  
Review for Final

Name \_\_\_\_\_

Find the angle of smallest possible positive measure that is coterminal with the given angle.

- 1)  $472^\circ$   
A)  $292^\circ$                       B)  $102^\circ$                       C)  $112^\circ$                       D)  $236^\circ$

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

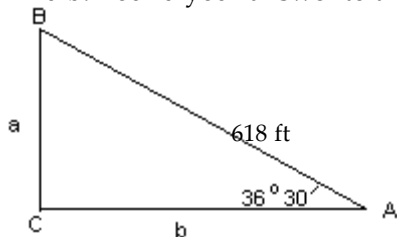
- 2) Find  $\sec \theta$  if  $\tan \theta = \frac{3}{4}$  and  $\theta$  is in quadrant I.  
A)  $\frac{5}{4}$                       B)  $-\frac{3}{2}$                       C)  $-\frac{\sqrt{7}}{9}$                       D)  $\frac{3\sqrt{7}}{7}$

Find the reference angle for the given angle.

- 3)  $\frac{13\pi}{6}$   
A)  $2\pi$                       B)  $-\frac{\pi}{6}$                       C)  $\frac{\pi}{7}$                       D)  $\frac{\pi}{6}$

Solve for the requested quantity.

- 4) Find  $b$ . Round your answer to the hundredths place.



- A)  $b = 490.39$  feet                      B)  $b = 545.98$  feet                      C)  $b = 496.78$  feet                      D)  $b = 499.25$  feet

Convert the radian measure to degrees.

- 5)  $-\frac{\pi}{3}$   
A)  $-60\pi^\circ$                       B)  $-60^\circ$                       C)  $-\left(\frac{\pi}{3}\right)^\circ$                       D)  $-1.05^\circ$

Find the amplitude or period as requested.

- 6) Find the amplitude of  $y = -5 \cos \left( 3x + \frac{\pi}{4} \right)$ .  
A)  $-15$                       B)  $\frac{\pi}{2}$                       C)  $3$                       D)  $5$

**Find the phase shift of the function.**

7)  $y = -5 \cos(8x + \pi)$

A)  $\frac{\pi}{5}$  units to the left

B)  $5\pi$  units to the right

C)  $8\pi$  units to the right

D)  $\frac{\pi}{8}$  units to the left

**Find the specified quantity.**

8) Find the period of  $y = 4 \sin\left(6x + \frac{\pi}{2}\right)$ .

A)  $\frac{\pi}{3}$

B) 4

C) 6

D)  $\pi$

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

9) Find  $\tan \theta$  if  $\sec \theta = \frac{\sqrt{17}}{4}$  and  $\sin \theta < 0$ .

A) 4

B)  $-\sqrt{17}$

C)  $-\frac{1}{4}$

D) -4

**Use the fundamental identities to simplify the expression.**

10)  $\cos \theta - \cos \theta \sin^2 \theta$

A)  $\tan^2 \theta$

B)  $\cos^3 \theta$

C)  $\sec^2 \theta$

D)  $\sin \theta$

**Perform the indicated operations and simplify the result.**

11)  $\tan^2 \theta - 3 \sin \theta \tan \theta \sec \theta$

A)  $\sin \theta \tan \theta$

B)  $\sec \theta \csc \theta$

C)  $1 + \cot \theta$

D)  $-2 \tan^2 \theta$

**Find the exact value of the expression using the provided information.**

12) Find  $\cos(A - B)$  given that  $\cos A = -\frac{12}{13}$ , with A in quadrant II, and  $\sin B = \frac{8}{17}$ , with B in quadrant II.

A)  $\frac{140}{221}$

B)  $\frac{220}{221}$

C)  $-\frac{220}{221}$

D)  $-\frac{140}{221}$

**Find the exact value by using a sum or difference identity.**

13)  $\tan 75^\circ$

A)  $\sqrt{3} + 2$

B)  $-\sqrt{3} - 2$

C)  $-\sqrt{3} + 2$

D)  $\sqrt{3} - 2$

**Evaluate the expression exactly.**

14)  $\cot(\sin^{-1} \frac{18}{30})$

A)  $\frac{30}{18}$

B)  $\frac{24}{18}$

C)  $\frac{18}{30}$

D)  $\frac{18}{24}$

15)  $\sin(2 \arcsin \frac{1}{4})$

A)  $\frac{5}{16}$

B)  $\frac{7}{8}$

C)  $\frac{\sqrt{15}}{16}$

D)  $\frac{\sqrt{15}}{8}$

Solve the equation exactly over the interval  $[0, 2\pi)$ .

16)  $\sin^2 x + \sin x = 0$

A)  $\left\{0, \pi, \frac{4\pi}{3}, \frac{5\pi}{3}\right\}$

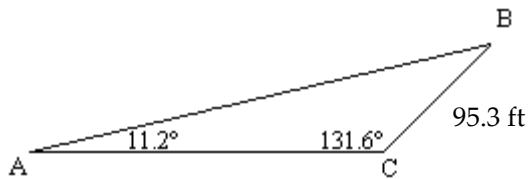
B)  $\left\{0, \pi, \frac{3\pi}{2}\right\}$

C)  $\left\{0, \pi, \frac{\pi}{3}, \frac{5\pi}{3}\right\}$

D)  $\left\{0, \pi, \frac{\pi}{3}, \frac{2\pi}{3}\right\}$

Solve the triangle, if possible.

17)



A)  $B = 36.8^\circ, b = 293.9 \text{ ft}, c = 366.9 \text{ ft}$

C)  $B = 37.2^\circ, b = 296.7 \text{ ft}, c = 366.9 \text{ ft}$

B)  $B = 37.2^\circ, b = 30.6 \text{ ft}, c = 24.9 \text{ ft}$

D)  $B = 37.2^\circ, b = 366.9 \text{ ft}, c = 296.7 \text{ ft}$

Find the missing parts of the triangle.

18)  $a = 8.2 \text{ in.}$

$b = 13.0 \text{ in.}$

$c = 16.6 \text{ in.}$

A)  $A = 27.05^\circ, B = 50.34^\circ, C = 102.61^\circ$

C)  $A = 31.05^\circ, B = 48.34^\circ, C = 100.61^\circ$

B)  $A = 29.05^\circ, B = 50.34^\circ, C = 100.61^\circ$

D) No triangle satisfies the given conditions.

Solve the problem.

19) Two ships leave a harbor together traveling on courses that have an angle of  $125^\circ$  between them. If they each travel 541 miles, how far apart are they (to the nearest mile)?

A) 500 mi

B) 41 mi

C) 1920 mi

D) 960 mi

Find the area of triangle ABC with the given parts.

20)  $A = 28.5^\circ$

$b = 13.5 \text{ in.}$

$c = 8.6 \text{ in.}$

A)  $53 \text{ in.}^2$

B)  $26 \text{ in.}^2$

C)  $28 \text{ in.}^2$

D)  $51 \text{ in.}^2$

Find the magnitude and direction angle (to the nearest tenth) for each vector. Give the measure of the direction angle as an angle in  $[0, 360^\circ]$ .

21)  $\langle 3\sqrt{3}, 3 \rangle$

A) 12;  $30^\circ$

B)  $6\sqrt{2}$ ;  $60^\circ$

C) 6;  $30^\circ$

D) 6;  $150^\circ$

Find the component form of the indicated vector.

22) Let  $\mathbf{u} = \langle -6, 7 \rangle$ ,  $\mathbf{v} = \langle 2, 2 \rangle$ . Find  $9\mathbf{u} + 3\mathbf{v}$ .

A)  $\langle -60, 57 \rangle$

B)  $\langle 9, 12 \rangle$

C)  $\langle -48, 69 \rangle$

D)  $\langle -36, 27 \rangle$

Find the dot product for the given vectors.

23)  $\langle -13, 15 \rangle, \langle -6, 4 \rangle$

A) 18

B) 78

C) 60

D) 138

Write the number as the product of a real number and  $i$ .

24)  $\sqrt{-20}$

A)  $-2i\sqrt{5}$

B)  $-2\sqrt{5}i$

C)  $2i\sqrt{5}$

D)  $2\sqrt{5}i$

Solve the equation.

25)  $x^2 = -81$

A) 0, 9i

B)  $\pm 9i$

C)  $\pm 81i$

D) 0,  $-81i$

Find the product. Write the answer in standard form.

26)  $i(2 - 4i)(9 - 3i)$

A)  $12i^3 + 42i^2 + 18i$

B)  $42 + 6i$

C)  $-42 - 6i$

D)  $30 - 30i$

Find the quotient. Write the answer in standard form.

27)  $\frac{11}{-i}$

A) 11

B)  $11i$

C)  $-11$

D)  $-11i$

Write the complex number in rectangular form.

28)  $7 \operatorname{cis} 240^\circ$

A)  $-\frac{7}{2} - \frac{7i\sqrt{3}}{2}$

B)  $\frac{-7\sqrt{3}}{2} - \frac{7i}{2}$

C)  $\frac{7}{2} - \frac{7i\sqrt{3}}{2}$

D)  $-\frac{7}{2} + \frac{7i\sqrt{3}}{2}$

Write the complex number in trigonometric form  $r(\cos \theta + i \sin \theta)$ , with  $\theta$  in the interval  $[0^\circ, 360^\circ)$ .

29)  $4\sqrt{3} - 4i$

A)  $8(\cos 30^\circ + i \sin 30^\circ)$

B)  $8(\cos 300^\circ + i \sin 300^\circ)$

C)  $8(\cos 60^\circ + i \sin 60^\circ)$

D)  $8(\cos 330^\circ + i \sin 330^\circ)$

Convert to rectangular coordinates.

30)  $\left(12, -\frac{\pi}{4}\right)$

A)  $(6\sqrt{2}, 6\sqrt{2})$

B)  $(6\sqrt{2}, -6\sqrt{2})$

C)  $(-6\sqrt{2}, -6\sqrt{2})$

D)  $(-6\sqrt{2}, 6\sqrt{2})$

Convert to a polar equation.

31)  $8x - 3y + 10 = 0$

A)  $r = \frac{-10}{8 \sin \theta - 3 \cos \theta}$

B)  $r = \frac{-10}{8 \cos \theta - 3 \sin \theta}$

C)  $8 \cos \theta - 3 \sin \theta = -10$

D)  $r = 8 \cos \theta - 3 \sin \theta$

Find an equivalent equation in rectangular coordinates.

32)  $r = \frac{5}{1 + \cos \theta}$

A)  $y^2 = 10x - 25$

B)  $y^2 = 25 - 10x$

C)  $x^2 = 25 - 10y$

D)  $x^2 = 10y - 25$

The rectangular coordinates of a point are given. Express the point in polar coordinates with  $r \geq 0$  and  $0^\circ \leq \theta < 360^\circ$ .

33)  $(-\sqrt{2}, -\sqrt{2})$

A)  $(4, 225^\circ)$

B)  $(2, 225^\circ)$

C)  $(2, 315^\circ)$

D)  $(\sqrt{2}, 135^\circ)$

Find the product. Write the product in rectangular form, using exact values.

34)  $[4(\cos 120^\circ + i \sin 120^\circ)] [5(\cos 120^\circ + i \sin 120^\circ)]$

A)  $10\sqrt{3} - 10i$

B)  $10 + 10\sqrt{3}i$

C)  $-10\sqrt{3} + 10i$

D)  $-10 - 10\sqrt{3}i$

Perform the indicated operations. Simplify the answer.

35)  $\sqrt{-11} \cdot \sqrt{-11}$

A)  $11i$

B)  $-11$

C)  $-11i$

D)  $11$

## Answer Key

Testname: TRIG REVIEW FINAL

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