**Trigonometry/Precalculus Name**

**Fall Semester Final Review Date**

**Days \_\_\_\_\_\_\_ &\_\_\_\_\_\_\_\_\_ Block**

**Chapter 6**

#### 1) Given triangle ABC with solve for <B.

#### 2) Given triangle CAT with <C = 40ᵒ, <A = 30ᵒ, and side t = 30ft, solve for side c.

**3**a) Label the two different triangles, both with <*A* = 43º, *a* = 19, *b* = 25.

 ***A******A***

#### 3b) Solve the two triangles you sketched in part a. (all missing <’s & sides)

**< B = <B =**

**<C = <C =**

**c = c =**

**4)** Given triangle ABC with  find the length of side b.

**5)** Given triangle ABC with *a* = 10 inches, *b* = 8 inches, and *c* = 12 inches, find the measure of its angles.

**6)** A forest has a rabbit population whose population fluctuates over time and can be modeled by the equation y = 6,000 sin $\frac{π}{2}\left(x-4\right)+10,000$ where y is the population of rabbits and x is the time after the population study begins in years.

|  |  |
| --- | --- |
| a) Find the first time after the study begins when the population reaches 9,400 rabbits. | b) According to the model, what would the population be after 5 years? A close up of an animal  Description automatically generated |

**7)** The angle of elevation from a spot on the ground 30 feet from the base of a tree to the top of a tree is 50°. How tall is the tree?





Find the component form and magnitude of the vector.

**8)** initial point (1, 5) and terminal point (10, 9) **9)** initial point (5, -3) and terminal point (-2, -1)

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**10)** Find the following given $\rightharpoonaccent{u}= \left〈-1, -3\right〉$**,** $\rightharpoonaccent{v}= \left〈-3, 6\right〉$

a) $\frac{2}{3}\rightharpoonaccent{v}$ b) 2$\rightharpoonaccent{v}- 5\rightharpoonaccent{u}$

**11)** Use the following vectors to complete the problems: $\rightharpoonaccent{u}= \left〈1, -4\right〉$**,** $\rightharpoonaccent{v}= \left〈2, 5\right〉$

**a.** $\rightharpoonaccent{u}+ \rightharpoonaccent{v}$ **b.** $\rightharpoonaccent{u}- \rightharpoonaccent{v}$ **c.** $\left‖\rightharpoonaccent{v}\right‖$

Find the dot product of the following. Find the value of **x** so that the vectors are

 **12)** $\rightharpoonaccent{u}= \left〈0, -2\right〉$ and $\rightharpoonaccent{v}= \left〈1, 10\right〉$ orthogonal.

 **13)** $\rightharpoonaccent{b}= \left〈 \frac{5}{3}, -2\right〉$ and $\rightharpoonaccent{c}= \left〈 x, 36\right〉$

Determine if the vectors are **orthogonal**, **parallel**, or **neither**.

**14)** $\rightharpoonaccent{u}= \left〈39, -12\right〉, \rightharpoonaccent{v}= \left〈-26, 8\right〉$ **15)** $\rightharpoonaccent{u}= \left〈8, -4\right〉, \rightharpoonaccent{v}= \left〈5, 10\right〉$

Find the angle *θ* between the vectors.

**16)** $\rightharpoonaccent{u}= \left〈2\sqrt{2}, -4\right〉, \rightharpoonaccent{v}= \left〈-\sqrt{2}, 1\right〉$ **17)** $\rightharpoonaccent{u}= \left〈3, 1\right〉, \rightharpoonaccent{v}= \left〈4, 5\right〉$

**18)** Two soccer players kick a ball at the exact same time, the first player with a force of 25 N at a 60° angle in standard position. The second player kicks with a force of 30 N at an angle of 120° in standard position.

|  |  |
| --- | --- |
| a) Write each force in component form. | b) Find the sum of the forces in component form. |
| c) Find the magnitude of the combined forces. | d) Find the bearing of the resultant force. (measured from standard position) |



**19)** An airplane has an airspeed of 430 mph at a bearing of 135° (measured from due North.) The wind velocity is 35 mph blowing directly to the east. Find the resultant speed and bearing of the plane.

 

**Chapter 4**

**20)** Change the degrees to radians and the radians to degrees. (leave as exact values)

|  |  |  |  |
| --- | --- | --- | --- |
| a)  radians **[ 0.698 radians]** | b) 115 degrees  | c)  radians**[ 51.43 degrees ]** | d) -260 degrees |

**21)** If , find the exact value of each of the remaining 5 trig functions.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|

|  |  |  |
| --- | --- | --- |
| sin  | csc  | tan  |
| cos  | sec  | cot  |

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**22)** Find the equation of a sine function shifted left 5 , shifted up 9, with amplitude 4 and

period.

**23)** Find the equation of a cosine function shifted right 3 , shifted down 9, with amplitude 7 and

period π.

**24)** Write an equation for each of the following sinusoidal curves using each indicated point:

|  |  |
| --- | --- |
| a) | b) Description: http://www.regentsprep.org/Regents/math/algtrig/ATT7/sinuso39.gif |

**A) A)**

**B) B)**

|  |  |
| --- | --- |
| c) A picture containing indoor, sky  Description automatically generated | d)  Description: http://hotmath.com/help/solutions/genericalg2/11/3/TrigonometricIdentities,GraphsandFormulas/genericalg2_11_3_TrigonometricIdentities,GraphsandFormulas_5_1010/f-426-11-oyo-1.gif |

**A) A)**

**B) B)**

For each of the following, state the amplitude, period and shifts, then graph 2 cycles of the curve.

**25)** $y=-4\cos(\left(2x\right))$



Amplitude:

Period:

Vertical Shift:

Horizontal Shift:

y

x

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**26)** $y=2\sin(x)+1$

Amplitude:

Period:

Vertical Shift:

Horizontal Shift:

**27)** Find the measure of each missing side.

|  |  |  |
| --- | --- | --- |
|  |  | y34ᵒx10 |



**28)** Find exact value for each of the following angles. Leave answers in simplified radical form.

Find the exact values of the following: (leave answers in simplified radical form)

a)  b)  c) 

d)  e) cos f) cot 

**29)** Using the idea of coterminal angles, find the exact value of the following:

|  |  |
| --- | --- |
| a)  | b)  |

Evaluate each expression:



|  |  |  |
| --- | --- | --- |
| **30)**  | **31)**  | **32)**  |

**Chapter 5**

Solve for 𝜃 on the interval of [0, 2π)

**33)  34) **

**35)  36) **

**37)  38)** $cos x tan x-cos x=0$

**39)** $\sin(2)θ+1=0$ **40) 2cos 4**$ θ-√2$ **= 0**



Simplify the following using identities:

**41)  42)  43) **

Verify the following trigonometric identities:

**44)  45)** $secθ-sinθtanθ=cosθ$

|  |  |
| --- | --- |
|  Image result for free winter clipart black and white |  |

**46)** At a dock in the San Francisco Bay, the depth of the water is 20 feet at low tide at 2am and high tide is 26 feet, which occurs 5 hours later. This motion can be modeled using a sinusoidal curve. Draw a graph and write a sinusoidal equation to represent the depth of the water (y) as a function of time in hours after midnight. (x)

**47**) Use a sum and difference identity to find the exact value of sin 285ᵒ.

**48)** Use a sum or difference formula to find the exact value of cos 255ᵒ.

If  and , find the exact value of each of the following. (leave answers in simplified radical form when appropriate

**49)  50) **

**51)** sin 2u **52)** cos 2u  **53)** tan 2u

Find the exact value for each of the following given where , and where .

**54)  55**) 

 