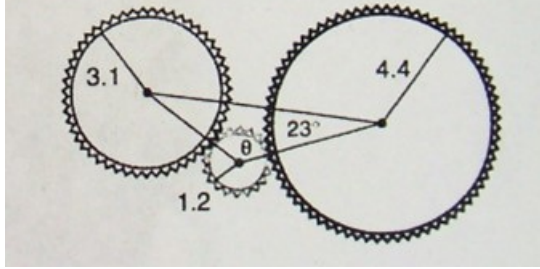


6 Review day 1.notebook

- 1.) Three gears are arranged as shown. Determine the measure of angle θ correct to the nearest degree.




Warm up

For problems 2 and 3 round your answer to the nearest tenth.

- Solve the triangle given $B = 43$, $a = 22$, $b = 17$.
- Find the area of a triangle with sides $a = 6$, $b = 12$, $c = 7$.

Apr 10-5:56 AM



GO COUGARS!

p 445 **Homework Questions**

In Exercises 1-4, find the dot product of u and v .

1. $u = (6, 3)$	2. $u = (-4, 1)$
$v = (2, -4)$	$v = (2, -3)$
3. $u = 5i + j$	4. $u = 3i + 2j$
$v = 3i - j$	$v = -2i + j$

In Exercises 5-10, use the vectors $u = \langle 2, 2 \rangle$, $v = \langle -3, 4 \rangle$, and $w = \langle 1, -4 \rangle$ to find the indicated quantity. State whether the result is a vector or a scalar.

5. $u \cdot u$	6. $v \cdot w$
7. $u \cdot 2v$	8. $4u \cdot v$
9. $3w \cdot v$	10. $(u \cdot 7v)w$

In Exercises 11-16, use the dot product to find the magnitude of u .

11. $u = (-5, 12)$	12. $u = (2, -4)$
13. $u = 20i + 25j$	14. $u = 6i - 10j$
15. $u = -4j$	16. $u = 9i$

In Exercises 17-24, find the angle θ between the vectors.

17. $u = (-1, 0)$	18. $u = (4, 4)$
$v = (0, 2)$	$v = (-2, 0)$
19. $u = 3i + 4j$	20. $u = 2i - 3j$
$v = -2i + 3j$	$v = i - 2j$
21. $u = 2i$	22. $u = 4j$
$v = -3j$	$v = -3i$

23. $u = \cos\left(\frac{\pi}{3}\right)i + \sin\left(\frac{\pi}{3}\right)j$
 $v = \cos\left(\frac{3\pi}{4}\right)i + \sin\left(\frac{3\pi}{4}\right)j$

In Exercises 25-28, graph the vectors and find the degree measure of the angle between the vectors.

25. $u = 2i - 4j$	26. $u = -6i - 3j$
$v = 3i - 5j$	$v = -8i + 4j$
27. $u = 6i - 2j$	28. $u = 2i - 3j$
$v = 8i - 5j$	$v = 4i + 3j$

In Exercises 29 and 30, use vectors to find the interior angles of the triangle with the given vertices.

29. $(1, 2), (3, 4), (2, 5)$
 30. $(-3, 0), (2, 2), (0, 6)$

In Exercises 31 and 32, find $u \cdot v$, where θ is the angle between u and v .

31. $\|u\| = 9, \|v\| = 36, \theta = \frac{3\pi}{4}$

Feb 2-9:51 PM

6 Review day 1.notebook

Chapter 6 Review Topics

Law of Sines $\frac{\sin A}{a} = \frac{\sin B}{b} = \frac{\sin C}{c}$

1 Δ if given \angle and 2 sides, opp side, adj side \Rightarrow h=opp, sin
 given an obtuse angle, opp > adj sin
 given 2 angles

2 Δ if given \angle and 1 side, opp side, adj side \Rightarrow h=opp, sin
 if given an obtuse angle, opp > adj sin

3 Δ if given \angle and 2 sides, opp side, adj side \Rightarrow h=opp, sin
 Area $K = \frac{1}{2}ab \sin C = \frac{1}{2}(side)(side)(\sin(\text{angle between sides}))$

Law of Cosines $a^2 = b^2 + c^2 - 2bc \cos A$ SAS
 $\cos A = \frac{b^2 + c^2 - a^2}{2bc}$ SSS
 Area: Heron's Formula $s = \frac{a+b+c}{2}$
 $K = \sqrt{s(s-a)(s-b)(s-c)}$

Word problems using LOS, LOC
 bearings are measured from North direction
 look for alternate interior angles
 might use SOH CAHTOA to find heights
 Arc Length: $AL = \text{radius} \cdot \text{radians}$

Vectors
 find component form from points using terminal-initial
 sketch resultant vectors
 vector arithmetic
 find magnitude $\|u\| = \sqrt{u_x^2 + u_y^2}$
 find component form
 standard unit vector form (i, j) form
 unit vector $\langle \frac{u_x}{\|u\|}, \frac{u_y}{\|u\|} \rangle$
 find trig component form from component or standard unit vector form
 $\langle \|u\| \cos \theta, \|u\| \sin \theta \rangle$
 θ is direction angle
 1. find magnitude
 2. find direction angle using $\tan \theta = \frac{u_y}{u_x}$
 - apply the θ to the appropriate direction of the vector
 Application problems (boat & airplanes)
 Convert bearings to trig form
 to find new bearing use $\tan \theta = \frac{u_y}{u_x}$
 and apply as mentioned above
 Dot product $u \cdot v = u_x v_x + u_y v_y$ scalar
 Find angle between 2 vectors
 $\cos \theta = \frac{u \cdot v}{\|u\| \|v\|}$
 If $u \cdot v = 0 \Rightarrow \theta = 90^\circ$
 orthogonal vectors (means perpendicular)

Apr 10-2:13 PM

Review Practice Problems

- Use the given vectors for the following: $v = \langle -2, 3 \rangle$ $w = \langle 5, 1 \rangle$
 - sketch $w - v$
 - find the unit vector for vector v
 - find the trig component form of vector w (calc ok)

(5, 1)

$$\langle \sqrt{26} \cos 11.31, \sqrt{26} \sin 11.31 \rangle$$

$$\|v\| = \sqrt{5^2 + 1^2} = \sqrt{26}$$

$$\tan \theta = \frac{1}{5}$$

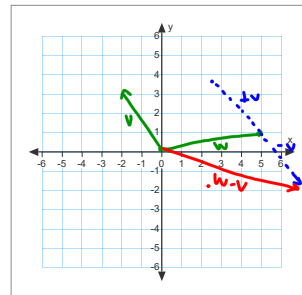
$$\theta = 11.31$$

$$\langle -2, 3 \rangle \text{ OI}$$

$$\|v\| = \sqrt{4 + 9} = \sqrt{13}$$

$$\tan \theta = \frac{3}{2} \text{ (RA)}$$

$$\theta = 56.31$$



$$\langle \sqrt{13} \cos 123.69, \sqrt{13} \sin 123.69 \rangle$$

Apr 15-6:00 AM

6 Review day 1.notebook

2. How many triangles with given information can be formed?

Do not solve.

a. $A = 61^\circ$, $a = 8$, $b = 21$



$$21 \sin 61 = h = 18.37$$

$$8 < 18.37 \quad \text{no } \Delta$$

b. $A = 112^\circ$, $a = 15$, $b = 17$



$$b > a \quad \text{no } \Delta$$

c. $B = 18^\circ$, $C = 65^\circ$, $c = 12$



$$2 \text{ angles given } \quad 1 \Delta$$

Apr 7-6:38 AM

3. Solve the triangle to two decimal places.

$$a = 7, b = 15, c = 19$$

$$7^2 = 15^2 + 19^2 - 2(15)(19) \cos A$$

$$16^2 = 7^2 + 19^2 - 2(7)(19) \cos B$$

$$19^2 = 7^2 + 15^2 - 2(7)(15) \cos C$$

$$A = \cos^{-1} \left(\frac{7^2 + 15^2 - 19^2}{-2(15)(19)} \right) = 19.59$$

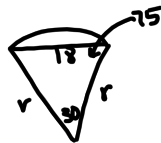
$$B = \cos^{-1} \left(\frac{15^2 + 7^2 - 19^2}{-2(7)(19)} \right) = 45.93$$

$$C = \cos^{-1} \left(\frac{19^2 + 7^2 - 15^2}{-2(7)(15)} \right) = 114.47$$

} 179.99 ✓

4. Twelve horses are equally spaced on a merry-go-round. If the chord connecting the center of each horse is 18 feet long, what is the diameter of the merry-go-round? What is the length of the arc between each horse?

$$\frac{360}{12} = 30^\circ$$



$$\frac{\sin 30}{18} = \frac{\sin 75}{r}$$

$$r = 34.77$$

$$d = 69.55 \text{ ft}$$

$$AL = 34.77 \left(30 \cdot \frac{\pi}{180} \right)$$

$$= 18.21 \text{ ft}$$

Apr 8-6:08 AM

HOMework



Review

p 461 1-73 odd, 79-90, 93, 95

p 465 1-15

Workbook p 151-152 1-12

p 445 2, 10, 28, 30, 32

Feb 2-9:51 PM

1. Solve the triangle.

$$B = 35, b = 12, c = 15$$

1. Solve the triangles given the following information.

a. $C = 75, b = 49, c = 48$

Apr 13-1:38 PM

6 Review day 1.notebook



Apr 16-11:57 AM