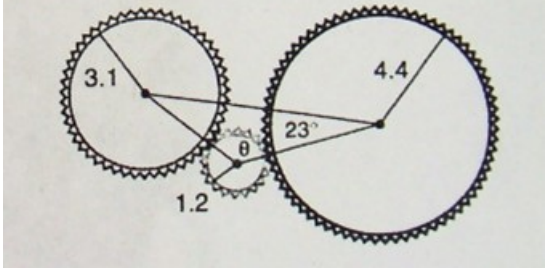
Warm up

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



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

2. Solve the triangle given B = 43, a = 22, b = 17.

3. 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. $\mathbf{u} = \langle 6, 3 \rangle$, $\mathbf{v} = \langle 2, -4 \rangle$
2. $\mathbf{u} = \langle -4, 1 \rangle$, $\mathbf{v} = \langle 2, -3 \rangle$
3. $\mathbf{u} = 5\mathbf{i} + \mathbf{j}$, $\mathbf{v} = 3\mathbf{i} - \mathbf{j}$
4. $\mathbf{u} = 3\mathbf{i} + 2\mathbf{j}$, $\mathbf{v} = -2\mathbf{i} + \mathbf{j}$

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

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

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

11. $\mathbf{u} = \langle -5, 12 \rangle$
12. $\mathbf{u} = \langle 2, -4 \rangle$
13. $\mathbf{u} = 20\mathbf{i} + 25\mathbf{j}$
14. $\mathbf{u} = 6\mathbf{i} - 10\mathbf{j}$
15. $\mathbf{u} = -4\mathbf{j}$
16. $\mathbf{u} = 9\mathbf{i}$

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

17. $\mathbf{u} = \langle -1, 0 \rangle$, $\mathbf{v} = \langle 0, 2 \rangle$
18. $\mathbf{u} = \langle 4, 4 \rangle$, $\mathbf{v} = \langle -2, 0 \rangle$
19. $\mathbf{u} = 3\mathbf{i} + 4\mathbf{j}$, $\mathbf{v} = -2\mathbf{i} + 3\mathbf{j}$
20. $\mathbf{u} = 2\mathbf{i} - 3\mathbf{j}$, $\mathbf{v} = \mathbf{i} - 2\mathbf{j}$
21. $\mathbf{u} = 2\mathbf{i}$, $\mathbf{v} = -3\mathbf{j}$
22. $\mathbf{u} = 4\mathbf{j}$, $\mathbf{v} = -3\mathbf{i}$
23. $\mathbf{u} = \cos\left(\frac{\pi}{3}\right)\mathbf{i} + \sin\left(\frac{\pi}{3}\right)\mathbf{j}$, $\mathbf{v} = \cos\left(\frac{3\pi}{4}\right)\mathbf{i} + \sin\left(\frac{3\pi}{4}\right)\mathbf{j}$

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

25. $\mathbf{u} = 2\mathbf{i} - 4\mathbf{j}$, $\mathbf{v} = 3\mathbf{i} - 5\mathbf{j}$
26. $\mathbf{u} = -6\mathbf{i} - 3\mathbf{j}$, $\mathbf{v} = -8\mathbf{i} + 4\mathbf{j}$
27. $\mathbf{u} = 6\mathbf{i} - 2\mathbf{j}$, $\mathbf{v} = 8\mathbf{i} - 5\mathbf{j}$
28. $\mathbf{u} = 2\mathbf{i} - 3\mathbf{j}$, $\mathbf{v} = 4\mathbf{i} + 3\mathbf{j}$

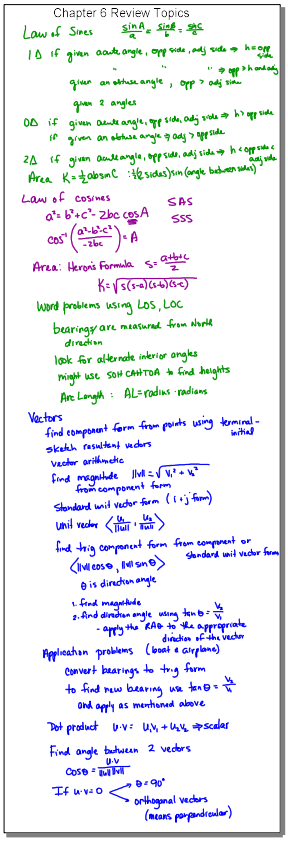
In Exercises 29 and 30, use vectors to find the interior angles of the triangle with the given vertices.

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

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

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

Feb 2-9:51 PM



Apr 10-2:13 PM

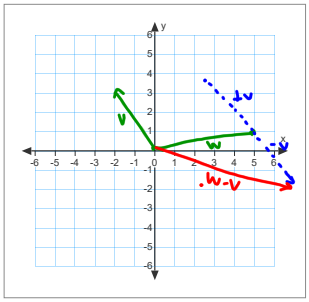
Review Practice Problems

1. Use the given vectors for the following: $v = \langle -2, 3 \rangle$ $w = \langle 5, 1 \rangle$

   a. sketch w - v

   b. find the unit vector for vector v

   c. find the trig component form of vector w (calc ok)

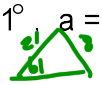


Apr 15-6:00 AM

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

Do not solve.

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



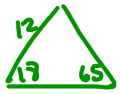
$21 \sin 61 = h = 18.37$

$8 < 18.37$ no Δ

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

$b > a$ no Δ

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



2 angles given 1 Δ

Apr 7-6:38 AM

3. Solve the triangle to two decimal places.

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

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

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

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

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

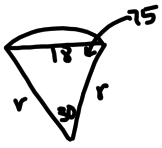
$B = \cos^{-1}\left(\frac{15^2 - 7^2 - 19^2}{-2(7)(19)}\right) = 45.93$

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

$\Sigma 179.99$ ✓

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?

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



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

$r = 34.77$

$d = 69.55$ ft

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

$= 18.21$ 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

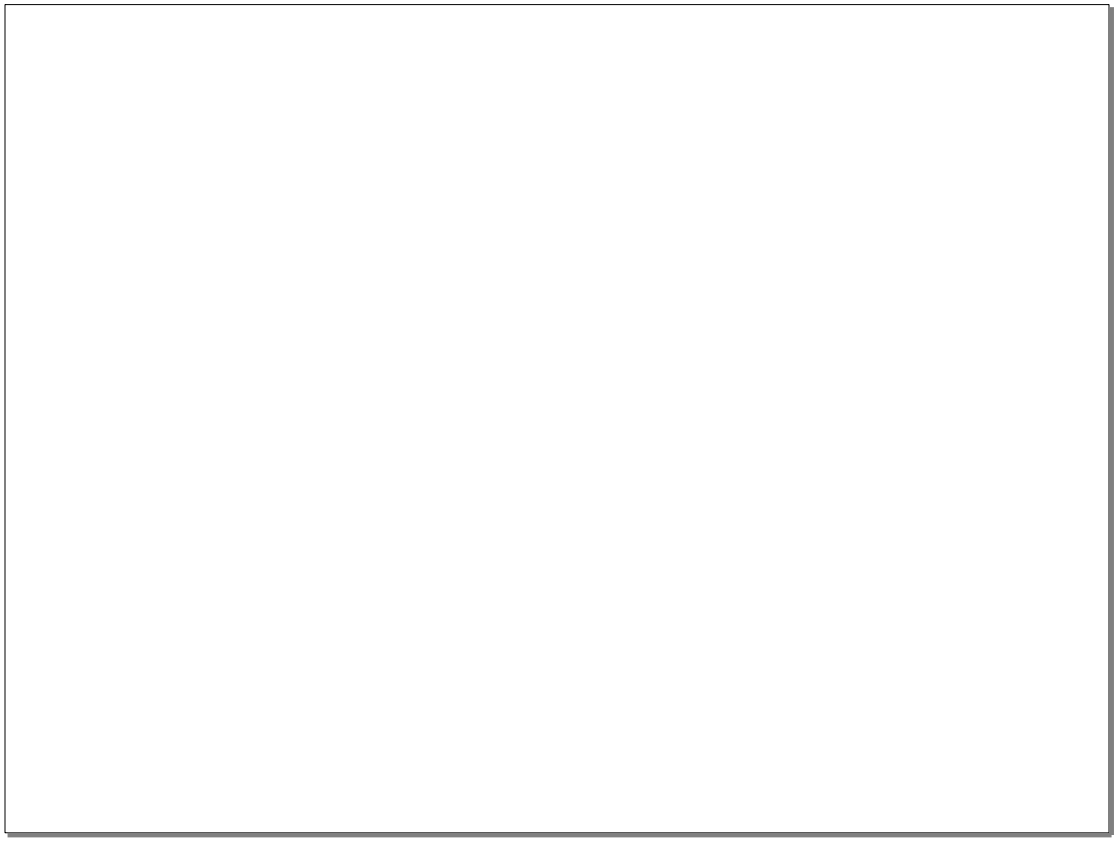
1. Solve the triangle.

   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



Apr 16-11:57 AM