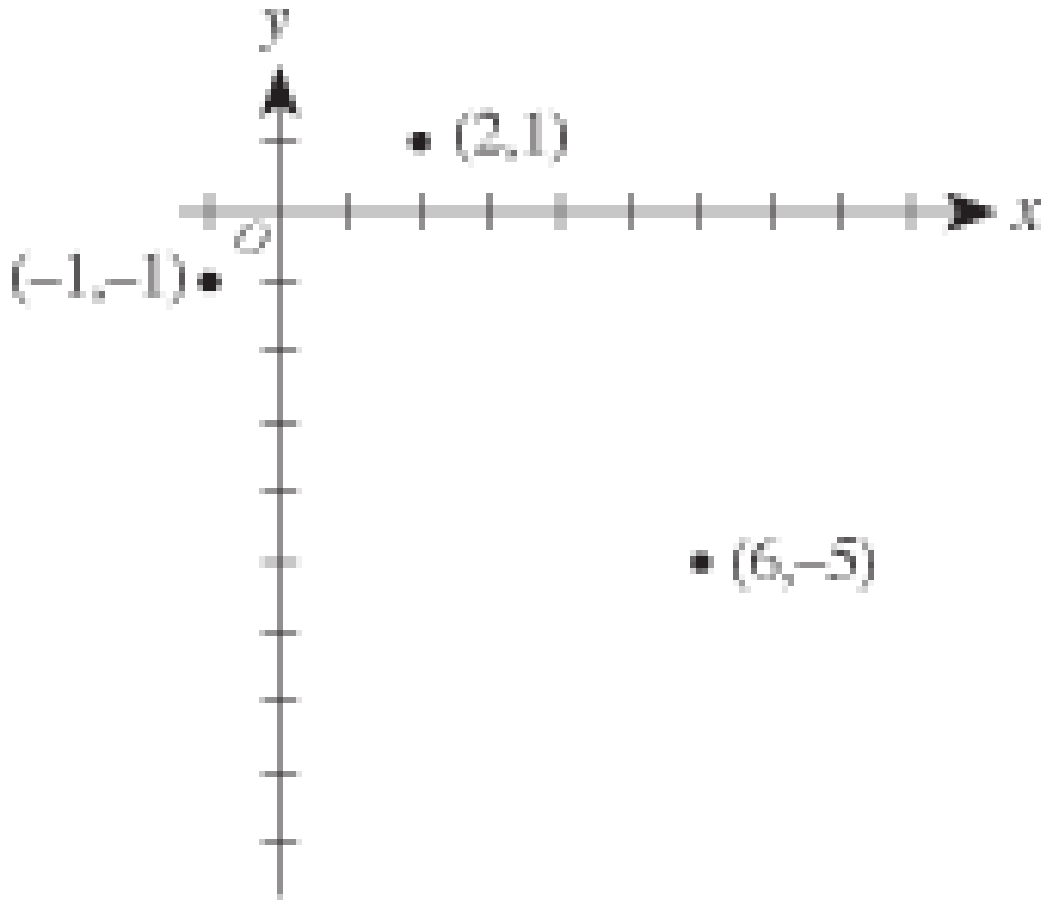
PRE-CALC & TRIG

Day 47

Bell Work

In the standard (*x*,*y*) coordinate plane below, 3 of the vertices of a rectangle are shown. Which of the following is the 4th vertex of the rectangle?

F.(3,–7)
G.(4,–8)
H.(5,–1)
I.(8,–3)
J.(9,–3)



From Last Time

Day 1: Pg 394 #5-7, 11-19 (odd)

Day 2: Pg 394 #9, 27-30, 33-34, 49

Day 3: Pg 394 #21, 39-42, 63, 75

5.4 Sum and Difference Formulas

Objective: Use sum and difference formulas to evaluate trig functions, verify identities, and solve trig equations

Sum and Difference Formulas *[page 398]*

$$\sin(u + v) = \sin u \cos v + \cos u \sin v$$

$$\sin(u - v) = \sin u \cos v - \cos u \sin v$$

$$\cos(u + v) = \cos u \cos v - \sin u \sin v$$

$$\cos(u - v) = \cos u \cos v + \sin u \sin v$$

Sum and Difference Formulas *[page 398]*

$$\tan(u + v) = \frac{\tan u + \tan v}{1 - \tan u \tan v}$$

$$\tan(u - v) = \frac{\tan u - \tan v}{1 + \tan u \tan v}$$

Example 1 (Evaluate a Trig Function)

Find the exact value of $\sin \frac{\pi}{12}$

Find the exact value of $\sin\frac{\pi}{12}$

Since $\frac{\pi}{12}=\frac{\pi}{3}-\frac{\pi}{4}$ then $\sin\frac{\pi}{12}=\sin\left(\frac{\pi}{3}-\frac{\pi}{4}\right)$

$$\sin\frac{\pi}{3}\cos\frac{\pi}{4}-\cos\frac{\pi}{3}\sin\frac{\pi}{4}=\frac{\sqrt{3}}{2}\frac{\sqrt{2}}{2}-\frac{1}{2}\frac{\sqrt{2}}{2}=\frac{\sqrt{6}-\sqrt{2}}{4}$$

Example 2 (Evaluate a Trig Function)

Find the exact value of $\cos 15°$

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Since $15 = 45 - 30$ then $\cos 15 = \cos(45 - 30)$

$$\cos 45 \cos 30 + \sin 45 \sin 30 = \frac{\sqrt{2}}{2}\frac{\sqrt{3}}{2} + \frac{\sqrt{2}}{2}\frac{1}{2} = \frac{\sqrt{6} + \sqrt{2}}{4}$$

Example 3 (Simplify the Expression)

Simplify: $\sin(\theta - \frac{\pi}{2})$

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$$\sin\theta\cos\frac{\pi}{2} - \cos\theta\sin\frac{\pi}{2} = (\sin\theta)(0) - (\cos\theta)(1) = -(\cos\theta)$$

For Next Time

Pg 402 #7-13 (odd), 37-40