

A Book of Abstract Algebra | (2nd Edition)



Chapter 30, Problem 7EC

Bookmark

Show all steps: ☒ ON 

Problem

An angle α is called *constructible* iff there exist constructible points A , B , and C such that $\angle ABC = \alpha$.

Prove the following:

The following angles are *not* constructible: 20° ; 40° , 140° . (HINT: Use the proof of Theorem 3.)

Step-by-step solution

Step 1 of 5

Here, objective is to prove that, the given angles are not constructible.

[Comment](#)

Step 2 of 5

Constructible angle:

An angle $\frac{2\pi}{N}$ is constructible if and only if N is either a power of two or power of two and a set of

distinct Fermat primes.

[Comment](#)

Step 3 of 5

Consider the angle 20°

$$\frac{360}{180} = 20^\circ$$

$$180 = 4 \times 5 \times 3 \times 3$$

180 is not product of a power of two or power of two and a set of distinct Fermat primes.

Hence, 20° is not a constructible angle.

[Comment](#)

Step 4 of 5

Consider the angle 40°

$$\frac{360}{9} = 40^\circ$$

$$9 = 3 \times 3$$

9 is not product of distinct Fermat primes

Hence, 40° is not a constructible angle.

[Comment](#)

Step 5 of 5

Consider the angle 140°

$$\frac{360}{19/7} = 140^{\circ}$$

$19/7$ is not a product of a power of two or power of two and a set of distinct Fermat primes.

Hence, 140° is not a constructible angle

[Comment](#)

COMPANY

About Chegg
Chegg For Good
College Marketing
Corporate Development
Investor Relations
Jobs
Join Our Affiliate Program
Media Center
Site Map

LEGAL & POLICIES

Advertising Choices
Cookie Notice
General Policies
Intellectual Property Rights
Terms of Use
Global Privacy Policy
Honor Code
Honor Shield

CHEGG PRODUCTS AND SERVICES

Cheap Textbooks
Chegg Coupon
Chegg Play
Chegg Study Help
College Textbooks
eTextbooks
Flashcards
Learn
Chegg Math Solver

Mobile Apps
Sell Textbooks
Solutions Manual
Study 101
Textbook Rental
Used Textbooks
Digital Access Codes
Chegg Money

CHEGG NETWORK

EasyBib
Internships.com
Thinkful

CUSTOMER SERVICE

Customer Service
Give Us Feedback
Help with eTextbooks
Help to use EasyBib Plus
Manage Chegg Study
Subscription
Return Your Books
Textbook Return Policy