Show All Solutions

Rosen, Discrete Mathematics and Its Applications, 8th edition
Extra Examples
Section 11.1—Introduction to Trees

Extra Examples — *Page references correspond to locations of Extra Examples icons in the textbook.*

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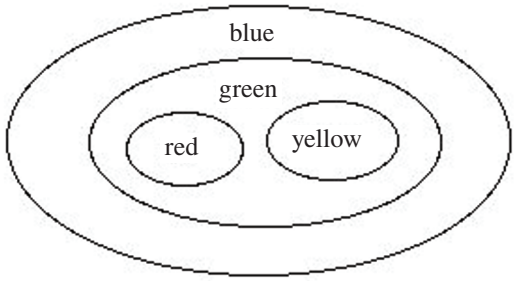
p.748, icon at Example 2
#1.

(a) Find the number of nonisomorphic rooted trees with four vertices.
(b) Find the number of nonisomorphic labeled rooted trees with four vertices. (Two trees are isomorphic as labeled trees if they are isomorphic with vertex *i* in the first graph corresponding to vertex *i* in the second graph.)
(c) Suppose you have four cloth bags — red, blue, green, and yellow. In how many different ways can they be put inside each other. (For example, the red bag and the yellow bag might be put separately inside the green bag, and this green bag might then be put inside the blue one, as in the following figure.)



See Solution

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Extra Examples
Section 11.2—Applications of Trees

Extra Examples — *Page references correspond to locations of Extra Examples icons in the textbook.*

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p.760, icon at Example 3
#1. Suppose you have five coins — three are good, but two are counterfeit. Assume that a counterfeit coin is heavier than a good coin and that the two heavy coins have the same weight. A balance scale will be used to find the bad coins and determine which are the heavy coins. Draw a decision tree that describes the process.

See Solution

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p.764, icon at Example 5

#1. Use Huffman coding to encode the following five symbols with given frequencies:

$A: 0.23 \quad B: 0.14 \quad C: 0.16 \quad D: 0.18 \quad E: 0.29$

See Solution

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Extra Examples
Section 11.3—Tree Traversal

Extra Examples — *Page references correspond to locations of Extra Examples icons in the textbook.*

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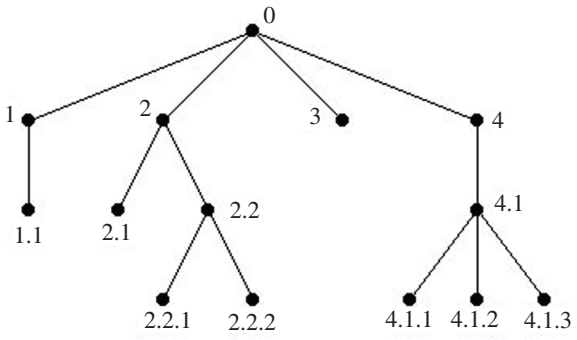
p.773, icon at Example 1
#1. Write in lexicographic ordering the universal address system labels for the following tree.



See Solution

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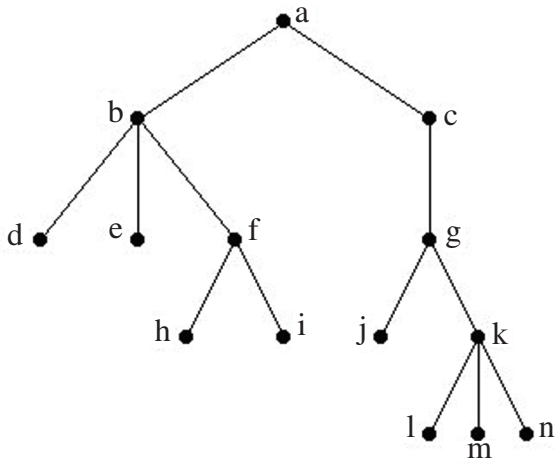
p.773, icon at Example 2
#1. Use a preorder traversal to list the vertices of the following tree.



See Solution

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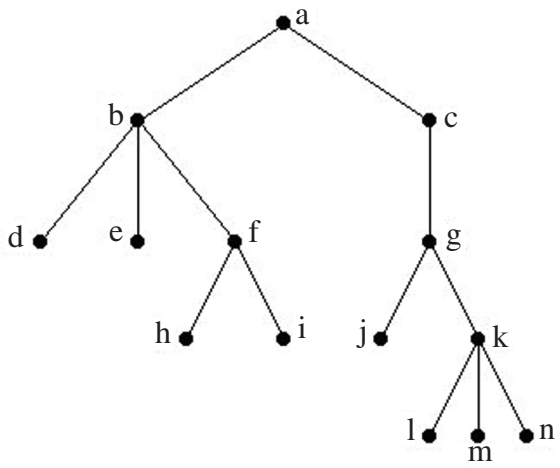
p.775, icon at Example 3

#1. Use an inorder traversal to list the vertices of the following tree.



See Solution

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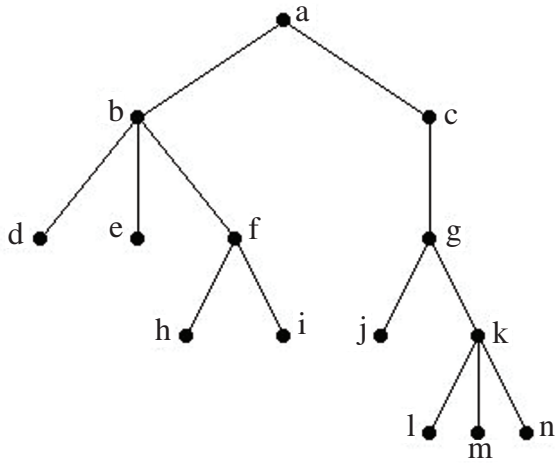
p.777, icon at Example 4

#1. Use a postorder traversal to list the vertices of the following tree.



See Solution

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p.782, icon at Example 10

#1. Write the algebraic expression $\dfrac{(3a + b^2)^3 - 7}{6c}$ in

(a) prefix notation.
(b) postfix notation.
(c) infix notation.

See Solution

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p.782, icon at Example 10

#2. Write the logic expression $\neg r \rightarrow (p \vee \neg(q \wedge \neg s))$ in prefix, postfix, and infix notation.

See Solution

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Rosen, Discrete Mathematics and Its Applications, 8th edition
Extra Examples
Section 11.4—Spanning Trees

Extra Examples — *Page references correspond to locations of Extra Examples icons in the textbook.*

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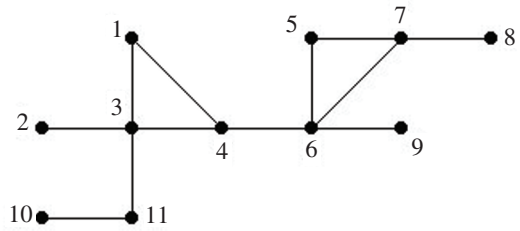
p.788, icon at Example 3
#1. Use a depth-first search to find a spanning tree for the following graph. Use vertex 1 as the root and use numerical ordering to determine in which order to visit the vertices.



See Solution

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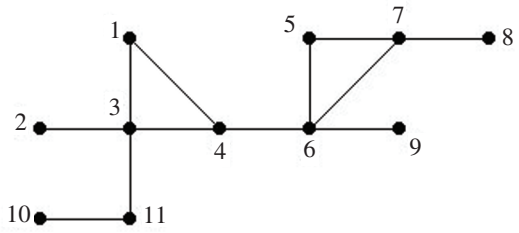
p.790, icon at Example 5

#1. Use a breadth-first search to find a spanning tree for the following graph. Use vertex 1 as the root and use numerical ordering to determine in which order to visit the vertices.



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Extra Examples
Section 11.5—Minimum Spanning Trees

Extra Examples — *Page references correspond to locations of Extra Examples icons in the textbook.*

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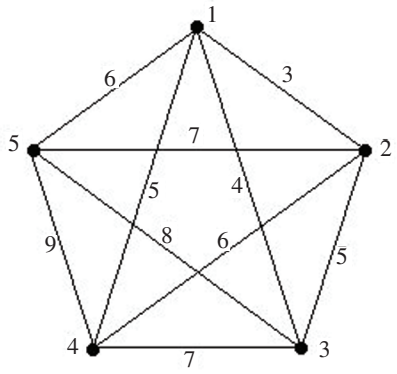
p.801, icon at Example 3
#1. Suppose the vertices of K_5 are numbered $1, 2, 3, 4, 5$ (in clockwise order) and each edge is assigned a weight equal to the sum of the labels on the endpoints of the edge, as in the following figure. Find a spanning tree of minimum weight for this graph.



See Solution

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p.801, icon at Example 3
#2. Suppose the vertices of K_n are numbered $1, 2, \ldots, n$ (in clockwise order) and each edge is assigned a weight equal to the sum of the labels on the endpoints of the edge. Find a spanning tree of minimum weight for this graph and find the weight of this spanning tree.

See Solution