Chapter 1: School Mathematics in a Changing World

Possible Questions for Assessment and Evaluation

1. T or F: The text states that the prevalent view of mathematics is mainly focused on computation with numbers.

Answer: F

Sec Ref: What is Mathematics?

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2. All of the following are topics that should be covered in a mathematics classroom, except:

A. algebra

B. geometry

C. measurement

D. geography

E. probability

Answer: D

Sec Ref: What is Mathematics?

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3. Using your own words, explain what is meant by each of the following five views of mathematics:

Mathematics is a study of patterns and relationships -

Mathematics is a way of thinking -

Mathematics is an art -

Mathematics is a language -

Mathematics is a tool -

Answer: Answers vary.

Sec Ref: What is Mathematics?

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4. Give two specific examples from the elementary school curriculum to illustrate each of the following views of mathematics:

Mathematics is a study of patterns and relationships -

Mathematics is a way of thinking -

Mathematics is an art -

Mathematics is a language -

Mathematics is a tool -

Answer: Answers vary.

Sec Ref: What is Mathematics?

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5. The text answers a question, “What is mathematics?” Which of the following is NOT a part of that description?

A. a language

B. a tool

C. a set of numbers

D. a study of patterns and relationships

E. a way of thinking

Answer: C

Sec Ref: What is Mathematics?

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6. T or F : In terms of the time devoted to it, mathematics is second only to science.

Answer: F

Sec Ref: What Determines the Mathematics Being Taught?

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7. Which of the following groups was responsible for establishing mathematics standards?

A. The National Math Council

B. The Math Association of America

C. The National Council of Teachers of Mathematics

D. The North American Math Council

E. None of the above

Answer: C

Sec Ref: What Determines the Mathematics Being Taught?

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8. Suppose you were asked to serve on a committee to come up with mathematics standards. Explain the three needs that you should take into consideration.

Answer: Should mention and explain the needs of the subject, the needs of

the child and the needs of society.

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9. T or F The three needs that should be taken into consideration when thinking about the mathematics curriculum are the needs of society, the needs of teachers, and the needs of the child.

Answer: F

Sec Ref: What Determines the Mathematics Being Taught?

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10. The text states that “mathematics continues to change.” In light of that, explain how and in what ways mathematics has changed.

Answer: Answer should include ideas such as shifting from social usefulness to unifying themes; new content being added at the elementary level, and other topics being introduced at earlier grade levels.

Sec Ref: What Determines the Mathematics Taught?

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11. The text mentions three general factors (needs) that should be considered when thinking about the mathematics curriculum. These three include the following:

A. subject, child, society

B. subject, child, teacher

C. parent, child, teacher

D. child, society, school

E. parent, teacher, society

Answer: A

Sec Ref: What Determines the Mathematics Being Taught?

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12. When a teacher believes that students will need to be able to solve problems and communicate so we can advance our technological world, he or she is considering the needs of the:

A. subject

B. child

C. government

D. parent

E. society

Answer: E

Sec Ref: What Determines the Mathematics Being Taught?

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13. A teacher considers that she must first review whole numbers before proceeding with a lesson on fractions. Which of the following needs is she most concerned with:

A. child

B. society

C. teacher

D. subject

E. international competition

Answer: D

Sec Ref: What Determines the Mathematics Being Taught?

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14. T or F The Committee of Seven recommended teaching mathematics topics according to students’ mental age.

Answer: T

Sec Ref: What Determines the Mathematics Being Taught?

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15. Explain what is meant by each of the following terms as they apply mathematics instruction and learning:

Mental discipline –

Incidental learning –

Field theory –

Answer: Mental discipline, working with mathematics problems strengthens the mind; incidental learning, children would learn as much mathematics as they needed and would learn it better if it was not systematically taught; field theory, emphasis on a planned program to encourage the development of insight and understanding.

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16. T or F The NCTM standards are prescriptive, meaning every state must use them.

Answer: F

Sec Ref: What Determines the Mathematics Being Taught?

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17. The No Child Left Behind legislation calls for annual testing in reading and mathematics each year in grades:

a. 1-3

b. 3-5

c. 3-8

d. 5-9

e. 4-9

Answer: C

Sec Ref: What Determines the Mathematics Being Taught?

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18. Explain what is meant by “high-stakes assessments”.

Answer: Assessments that are used to place students, what grade to record on their report card, whether to promote students to the next grade, and so on.

Sec Ref: What Determines the Mathematics Being Taught?

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19. What is the significance of the Common Core State Standards Initiative?

Answer: An attempt to have a common understanding across the United States of what students are expected to learn at each grade level. It will also bring more standardization to the mathematics education our of youth.

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20. Explain what is meant by each of the following principles:

Technology -

Curriculum -

Teaching -

Learning -

Assessment -

Equity -

Answer: Answers vary.

Sec Ref: What Determines the Mathematics Being Taught?

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21. The NCTM Principles and Standards document includes some underlying principles that should guide school mathematics programs. Which of the following is NOT one of those principles?

A. assessment

B. learning

C. teaching

D. technology

E. computation

Answer: E

Sec Ref: What Determines the Mathematics Being Taught?

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22. Do you agree or disagree with the following statement: Calculators should not be used because then students will not know how to compute. Explain your answer.

Answer: Answers vary.

Sec Ref: What Determines the Mathematics Being Taught?

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23. One of the NCTM Principles states that we should have high expectations for all students. Which Principle is this?

A. Curriculum

B. Equity

C. Learning

D. Teaching

E. Assessment

Answer: B

Sec Ref: What Determines the Mathematics Being Taught?

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24. What does the word equity mean? Is it synonymous with equality? Give examples to support your answer.

Answer: Answers vary.

Sec Ref: What Determines the Mathematics Being Taught?

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25. T or F Equity and equality are synonymous.

Answer: F

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26. In terms of the Curriculum Principle, explain what is meant by coherent, focused, and well articulated.

Answer: Coherent, fits mathematical ideas together in a meaningful way; focused, focuses on the important mathematics topics and ideas at each grade; well articulated, builds on previous learning and grows across the grades.

Sec Ref: What Determines the Mathematics Being Taught?

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27. All of the following are words associated with the Curriculum Principle, except for:

A. Logical

B. Coherent

C. Focused

D. Well articulated

Answer: A

Sec Ref: What Determines the Mathematics Being Taught?

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28. T or F The NCTM Learning Principle emphasizes the need for students to learn mathematics with understanding and build on prior knowledge and experiences.

Answer: T

Sec Ref: What Determines the Mathematics Being Taught?

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29. T or F The NCTM Learning Principle emphasizes the need for students to memorize mathematical facts.

Answer: F

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30. After looking at the scores on a test, a teacher realizes that a majority of the students missed an important concept. For the next two days, the teacher reviews the concept. Which of the following Principles does this illustrate?

A. learning

B. teaching

C. assessment

D. equity

E. technology

Answer: C

Sec Ref: What Determines the Mathematics Being Taught?

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31. To teach mathematics effectively, what are some things that a teacher must know?

Answer: Answer should include some of the following: knowledge of mathematics, knowledge of their students, and knowledge of the pedagogy.

Sec Ref: Recent Influences

Page Ref: 7

32. T or F According to a meta-analysis of 54 research studies, using calculators hinder the development of mathematical skills.

Answer: F

Sec Ref: What Determines the Mathematics Being Taught?

Page Ref: 7

33. T or F According to a research mentioned in the text, most states have the same grade-level expectations in the specificity and in the grade in which a skill was targeted.

Answer: F

Sec Ref: Where Can You Turn?

Page Ref: 8

34. Which of the following assessments is the nation’s measure of students’ achievement?

A. ASCD

B. NCTM

C. ACT

D. NAEP

E. SAT

Answer: D

Sec Ref: Where Can You Turn?

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35. T or F The NAEP is given to a sample of students at grades 8 and 12.

Answer: F

Sec Ref: Where Can You Turn?

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36. Discuss five sources of help that you can turn to when considering the mathematics program.

Answer: Answers should include five of the following: state and local

guidelines, research, cultural and international resources, history, textbooks,

electronic materials, professional organizations, other teachers.

Sec Ref: Where Can You Turn?

Page Ref: 7-10

37. Which of the following is NOT one of the resources mentioned in the text to which teachers may turn to obtain information about mathematics teaching?

A. parents

B. cultural and international resources

C. textbooks

D. professional organizations

E. electronic materials

Answer: A

Sec Ref: Where Can You Turn?

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38. What do the following acronyms stand for? Explain their significance.

NAEP -

TIMSS -

Answer: National Association for the Education of Young Children,

American Statistical Association, National Assessment of Educational

Progress, Trends in Mathematics and Science Study

Sec Ref: Where Can You Turn?

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39. T or F According to the 2007 TIMSS, U.S. fourth graders were below the international average.

Answer: F

Sec Ref: Where Can You Turn?

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40. T or F According to the TIMSS study, U.S. schools are more aligned with the recommendations of the NCTM standards than Japanese schools.

Answer: F

Sec Ref: Where Can You Turn?

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41. A teacher belongs to NCTM and her state mathematics teacher organization. Which of the following provides reason(s) for the teacher to be part of a professional organization?

A. journals

B. conferences

C. workshops

D. sharing of ideas

E. all of the above

Answer: E

Sec Ref: Where Can You Turn?

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42. What is your view of mathematics teaching? Support your answer with specific examples from the text.

Answer: Answers vary.

Sec Ref: What is Your Role Now?

Page Ref: 10

43. As you prepare to teach mathematics, what three challenges should you take into consideration?

Answer: Examine one’s dispositions and beliefs towards mathematics;

teaching means helping students learn, not just giving out information;

realize that doing and teaching mathematics are different

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