

Materials available: calculator, polyset (extended algebra tiles), graph paper, blank paper, ruler, dice, copy of question sheet, pencil

- A♠ 1.** Explain how factoring and multiplying polynomials can be modeled using physical representations.
- 2♠ 2.** Use a general form of the quadratic function to explain how parameters can be introduced to transform a function. For example, you might use this general form: $y = a(x - b)^2 + c$.
- 3♠ 3.** Use a radical equation to explain how to solve an equation and what it means to solve an equation.
e.g., $2x = \sqrt{6 - 5x}$
- 4♠ 4.** Say which is correct and explain why.
 $2 + 3 \times 5 = 25$ and/or $2 + 3 \times 5 = 17$
- 5♠ 5.** Why is $\frac{2}{3} + \frac{3}{4} = \frac{17}{12}$ and why is it not equal to $\frac{5}{7}$?
- 6♠ 6.** What does $\sin 40^\circ$ mean and why is it useful?
- 7♠ 7.** Explain why any number to the power of zero equals one.
- 8♠ 8.** If you roll a pair of dice 36 times, how many times should you expect the sum of the two dice be five? Explain your answer.
- 9♠ 9.** What is *slope* and how is it calculated? Why is it calculated like this?
- 10♠ 10.** Explain why it works to find the x -intercept of a function by substituting $y = 0$ into the equation.
- A♣ 11.** Explain why the area of a parallelogram is the same as the area of the rectangle with the same base and height.
- 2♣ 12.** What is calculus?
- 3♣ 13.** How do you place these numbers on a number line, and why there? $2, -3, \frac{1}{2}, \sqrt{5}, i$
- 4♣ 14.** Explain why there are exactly 12 ways of arranging the letters of the word FULL.
- 5♣ 15.** Describe a way of solving for x and y for this pair of equations. Explain why your method makes sense.
 $2y - x = 22$
 $3x + y = 4$
- 6♣ 16.** What is special about irrational numbers, and why do you think they are called “irrational”?
- 7♣ 17.** When is a number less than its square root? Why does this happen?
- 8♣ 18.** Explain why four consecutive 5% increases makes an increase that is larger than 20%.
- 9♣ 19.** If you are given some data showing increasing value of an investment, how would you model this as exponential growth? And why would you assume exponential growth?

ED 5422 Content Interviews Assessment

It is important for secondary mathematics teachers to be fluent in the mathematics they teach and to be able to explain it well. Therefore, some time in this course will be devoted to reviewing and explaining standard content of secondary mathematics. You will participate in a one-on-one interview with your instructor, during which your instructor will ask two or three randomly chosen questions from a bank that you will receive in advance. We will work through the bank of questions, which focus on developing explanations of the given mathematics concepts, as part of our classwork prior to the interviews. You must successfully complete the content interview in order to receive credit for this course. If you are unsuccessful in your initial content interview, you may try again, at a time arranged with your instructor.

During the interview, your instructor will assess your performance in the following areas:

- answering the question;
- choosing good examples (where appropriate);
- using good visual representations;
- explaining what you are doing;
- explaining what things are;
- communicating effectively, coherently, and clearly.

Performance will be assessed according to the following rubric based on the university calendar:

A+	excellent performance	consistently exceeds the standard
A		clearly meets and mostly exceeds the standard
A-		clearly meets and sometimes exceeds the standard
B+	good performance	very good, clearly meets the standard
B		clearly meets the standard
B-		meets the standard for the most part
C+	satisfactory performance	minimally meets the standard
C		
D	less than satisfactory performance	does not meet the standard
F	failure	does not meet the standard