Problem 1 *Consider the function* $f(x) = 5\,x^5 + 2\,x^6 + 8\,x^4 + 5\,x^7$. *According to the Fundamental Theorem of Algebra, how many (possibly complex-valued) zeros are there for* $f(x)$*?* $\boxed{7}$

Feedback(*`attempt`*): *The Fundamental Theorem of Algebra says that the number of zeros is exactly equal to the degree of the polynomial.*

Problem 1.1 *There are (at least/ exactly/ at most ✓)* $\boxed{7}$ *real-valued solutions.*

Feedback(*`correct`*): *Although we know there are exactly the same number of solutions as the degree of the polynomial, some of them might be complex-valued. So we only know that at most there are* 7 *real-valued solutions (since they may all be real) but some could be complex, so we don't know exactly how many real-valued solutions there are; at least not without doing a bunch more work.*

Problem 1.1.1 *This means there* ***could be*** *(more than/ exactly/ less than ✓)* 7 *real-valued zeros.*

Feedback(*`correct`*): *Remember that this means there definitely could be a lower number of real valued solutions than complex valued solutions. In particular, if there are irreducible quadratic factors; but we will cover this more later!*

Problem 1.2 *What is the leading term in this polynomial?* $\boxed{5\,x^7}$

Feedback(*`attempt`*): *Remember that you may need to simplify (combine like terms) the polynomial to get the correct leading term.*

Problem 1.3 *What is the leading coefficient in this polynomial?* $\boxed{5}$

Feedback(*`attempt`*): *Remember that you may need to simplify (combine like terms) the polynomial to get the correct leading coefficient.*

Problem 2 *Consider the function* $f(x) = 5\,x^{10}+6\,x^{10}+3\,x^{7}+7\,x^{5}$. *According to the Fundamental Theorem of Algebra, how many (possibly complex-valued) zeros are there for* $f(x)$*?* $\boxed{10}$

Feedback(*`attempt`*): *The Fundamental Theorem of Algebra says that the number of zeros is exactly equal to the degree of the polynomial.*

Problem 2.1 *There are (at least/ exactly/ at most ✓)* $\boxed{10}$ *real-valued solutions.*

Feedback(*`correct`*): *Although we know there are exactly the same number of solutions as the degree of the polynomial, some of them might be complex-valued. So we only know that at most there are* 10 *real-valued solutions (since they may all be real) but some could be complex, so we don't know exactly how many real-valued solutions there are; at least not without doing a bunch more work.*

Problem 2.1.1 *This means there* ***could be*** *(more than/ exactly/ less than ✓)* 10 *real-valued zeros.*

Feedback(*`correct`*): *Remember that this means there definitely could be a lower number of real valued solutions than complex valued solutions. In particular, if there are irreducible quadratic factors; but we will cover this more later!*

Problem 2.2 *What is the leading term in this polynomial?* $\boxed{11\,x^{10}}$

Feedback(*`attempt`*): *Remember that you may need to simplify (combine like terms) the polynomial to get the correct leading term.*

Problem 2.3 *What is the leading coefficient in this polynomial?* $\boxed{11}$

Feedback(*`attempt`*): *Remember that you may need to simplify (combine like terms) the polynomial to get the correct leading coefficient.*

Problem 3 *Consider the function* $f(x) = 7\,x^7 + 6\,x + 10\,x^5 + 2\,x^8$. *According to the Fundamental Theorem of Algebra, how many (possibly complex-valued) zeros are there for* $f(x)$*?* $\boxed{8}$

Feedback(*`attempt`*): *The Fundamental Theorem of Algebra says that the number of zeros is exactly equal to the degree of the polynomial.*

Problem 3.1 *There are (at least/ exactly/ at most ✓)* $\boxed{8}$ *real-valued solutions.*

Feedback(*`correct`*): *Although we know there are exactly the same number of solutions as the degree of the polynomial, some of them might be complex-valued. So we only know that at most there are* 8 *real-valued solutions (since they may all be real) but some could be complex, so we don't know exactly how many real-valued solutions there are; at least not without doing a bunch more work.*

Problem 3.1.1 *This means there* ***could be*** *(more than/ exactly/ less than ✓)* 8 *real-valued zeros.*

Feedback(*`correct`*): *Remember that this means there definitely could be a lower number of real valued solutions than complex valued solutions. In particular, if there are irreducible quadratic factors; but we will cover this more later!*

Problem 3.2 *What is the leading term in this polynomial?* $\boxed{2\,x^8}$

Feedback(*`attempt`*): *Remember that you may need to simplify (combine like terms) the polynomial to get the correct leading term.*

Problem 3.3 *What is the leading coefficient in this polynomial?* $\boxed{2}$

Feedback(*`attempt`*): *Remember that you may need to simplify (combine like terms) the polynomial to get the correct leading coefficient.*