### Lesson 14 Practice Problems

1. We know these things about a polynomial function, $f\left(x\right)$: it has exactly one relative maximum and one relative minimum, it has exactly three zeros, and it has a known factor of $\left(x−4\right)$. Sketch a graph of $f\left(x\right)$ given this information.
* 
1. Mai graphs a polynomial function, $f\left(x\right)$, that has three linear factors $\left(x+6\right)$, $\left(x+2\right)$, and $\left(x−1\right)$. But she makes a mistake. What is her mistake?
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1. Here is the graph of a polynomial function with degree 4.
* Select **all** of the statements that are true about the function.
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	1. The leading coefficient is positive.
	2. The constant term is negative.
	3. It has 2 relative maximums.
	4. It has 4 linear factors.
	5. One of the factors is $\left(x−1\right)$.
	6. One of the zeros is $x=2$.
	7. There is a relative minimum between $x=1$ and $x=3$.
1. State the degree and end behavior of $f\left(x\right)=2x^{3}−3x^{5}−x^{2}+1$. Explain or show your reasoning.
* (From Unit 2, Lesson 9.)
1. Is this the graph of $g\left(x\right)=\left(x−1\right)^{2}\left(x+2\right)$ or $h\left(x\right)=\left(x−1\right)\left(x+2\right)^{2}$? Explain how you know.
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* (From Unit 2, Lesson 10.)
1. Kiran thinks he knows one of the linear factors of $P\left(x\right)=x^{3}+x^{2}−17x+15$. After finding that $P\left(3\right)=0$, Kiran suspects that $x−3$ is a factor of $P\left(x\right)$, so he sets up a diagram to check. Here is the diagram he made to check his reasoning, but he set it up incorrectly. What went wrong?
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| *
 | * $x^{2}$
 | * $4x$
 | * -5
 |
| --- | --- | --- | --- |
| * $x$
 | * $x^{3}$
 | * $4x^{2}$
 | * $-5x$
 |
| * 3
 | * $3x^{2}$
 | * $12x$
 | * 15
 |

* (From Unit 2, Lesson 12.)
1. The polynomial function $B\left(x\right)=x^{3}+8x^{2}+5x−14$ has a known factor of $\left(x+2\right)$. Rewrite $B\left(x\right)$ as a product of linear factors.
* (From Unit 2, Lesson 13.)



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