## Unit 2 Lesson 7: Using Factors and Zeros

### 1 More Than Factors (Warm up)

#### Student Task Statement

$M$ and $K$ are both polynomial functions of $x$ where $M\left(x\right)=\left(x+3\right)\left(2x−5\right)$ and $K\left(x\right)=3\left(x+3\right)\left(2x−5\right)$.

1. How are the two functions alike? How are they different?
2. If a graphing window of $-5\leq x\leq 5$ and $-20\leq y\leq 20$ shows all intercepts of a graph of $y=M\left(x\right)$, what graphing window would show all intercepts of $y=K\left(x\right)$?

### 2 Choosing Windows

#### Student Task Statement

Mai graphs the function $p$ given by $p\left(x\right)=\left(x+1\right)\left(x−2\right)\left(x+15\right)$ and sees this graph.



She says, “This graph looks like a parabola, so it must be a quadratic.”

1. Is Mai correct? Use graphing technology to check.
2. Explain how you could select a viewing window before graphing an expression like $p\left(x\right)$ that would show the main features of a graph.
3. Using your explanation, what viewing window would you choose for graphing $f\left(x\right)=\left(x+1\right)\left(x−1\right)\left(x−2\right)\left(x−28\right)$?

### 3 What’s the Equation?

#### Student Task Statement

Write a possible equation for a polynomial whose graph has the following horizontal intercepts. Check your equation using graphing technology.

1. $\left(4,0\right)$
2. $\left(0,0\right)$ and $\left(4,0\right)$
3. $\left(-2,0\right)$, $\left(0,0\right)$ and $\left(4,0\right)$
4. $\left(-4,0\right),\left(0,0\right)$, and $\left(2,0\right)$
5. $\left(-5,0\right)$, $\left(\frac{1}{2},0\right)$, and $\left(3,0\right)$



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