Algebra w/ Trig

2.2 Evaluate and Graph Polynomial Functions

Warm-Up:

 

**3. The expression** *x*2 *–* 4 **represents the of matting in square inches** **that is need to mat picture. How much matting is needed if** *x* = 6**?**

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Example 1: Identify Polynomial Functions

**Decide whether the function is a polynomial function.
If so, write it in standard form and state its degree, type, and leading coefficient.**

 

 

Example 2: Evaluate by Direct Substitution

**Use direct substitution to evaluate** *f* (*x*) = 2*x*4 – 5*x*3 –4*x* + 8 **when** *x* = 3**.**

YOU TRY:

**Decide whether the function is a polynomial function. If so, write it in standard form and state its degree, type, and leading coefficient.**

**1**. *f* (*x*) = 13 – 2*x* ***2****. p (x) = 9x4 – 5x – 2 + 4* ***3.***  *h (x) = 6x2 + π – 3x*

***Use direct substitution to evaluate the polynomial function for the given value of*** *x****.***

***4.*** *f (x) = x4 + 2x3 + 3x2 – 7; x = –2* ***5.*** *g (x) = x 3 – 5x2 + 6x + 1; x = 4*

*Example 3: Evaluating by Synthetic Substitution*

***Use synthetic substitution to evaluate*** *f (x)* ***from Example*** *2* ***when*** *x = 3****.*** *f (x) = 2x4 – 5x3 –**4x + 8*

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*Example 4: Multiple Choice!!*

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*YOU TRY:*

***Use synthetic substitution to evaluate the polynomial function for the given value of*** *x.*

***6.*** *f (x) = 5x3 + 3x2 – x + 7; x = 2* ***7.*** *g (x) = – 2x4 – x3 + 4x – 5; x = – 1*

**8. Describe the degree and leading coefficient of the**

 **polynomial function whose graph is shown.**



Example 5: Graph Polynomial Functions

**Graph** (*a*) *f* (*x*) = – *x*3 + *x*2 + 3*x* – 3 **and** (*b*)*f* (*x*) = 5 *x*4 – *x*3 – 4*x*2 + 4**.**

*x*

*y*

*x*

*y*

Example 6: Solve a Multi-Step Problem

**The energy** *E* **(in foot-pounds) in each square foot of a wave is given by the model** *E* = 0.0029*s*4 **where** *s***is the wind speed (in knots). Estimate the wind speed needed to generate a wave with** 1000 **foot-pounds of energy per square foot.**

YOU TRY:

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**Graph the polynomial function.**

**9.** *f* (*x*) = *x*4 + 6*x*2 – 3 **10.** *f* (*x*) = 2*x*3 + *x*2 + *x* – 1

*x*

*y*

*x*

*y*

**11.** *f* (*x*) = 4 – 2*x*3

**12. WHAT IF? If wind speed is measured in miles per hour, the model in Example** 6 **becomes**

*E* = 0.0051*s*4**. What wind speed is needed to generate a wave with** 2000 **foot-pounds of energy per square foot?**

*x*

*y*

KEEP GOING:

**3. The estimated number of electric vehicles** *V* **in the** **United States from** 1995 to 2004 **is given by the equation** *V =* 10*x*4 + 200*x* + 3000, **where** *x* **is the number of years since** 1995. **Estimate the number of electric Vehicles in** 2003**.**

**1. Tell whether the function** *f*(*x*) = – 3*x*3 – 5*x* –1 + 8 **is**

 **a polynomial function. If so, write it in standard**

 **form and state its degree, type, and leading**

 **coefficient.**

**2. Use synthetic substitution to evaluate**

*f*(*x*) =4*x*4 – *x*3 + 3*x*2 + 5*x* – 3 **when** *x =*– 2