Secondary III 3-2 HW

Name: Selected Answers

Graphing Polynomials

Determine the function's domain, range, and end behavior. (Use interval notation for the domain and range.)

1. $f(x)=x^7$

2. $f(x)=-x^9$

Domain: $(-\infty,\infty)$
Range: $(-\infty,\infty)$

E.B: $\lim_{x\to-\infty} f(x)=\infty \uparrow$

$\lim_{x\to\infty} f(x)=-\infty \downarrow$

3. $f(x)=x^{10}$

Domain: $(-\infty,\infty)$
Range: $[0,\infty)$

E.B. $\lim_{x\to-\infty} f(x)=\infty \uparrow$

$\lim_{x\to\infty} f(x)=\infty \uparrow$

4. $f(x)=-x^4$

Determine the zeros and multiplicity of each zero and state the end behavior.

5. $f(x)=x(x+1)(x+3)$

6. $f(x)=(x+1)^2(x-1)(x-2)$

zeros: -1 (m.2), 1, 2

E.B: $\uparrow\uparrow$ $\lim_{x\to-\infty} f(x)=\infty$

$\lim_{x\to\infty} f(x)=\infty$

7. $f(x)=-x(x-2)^2$

zeros: 0, 2 (m.2)

E.B.: $\uparrow\downarrow$

$\lim_{x\to-\infty} f(x)=+\infty$

$\lim_{x\to\infty} f(x)=-\infty$

8. $f(x)=-(x-1)(x+2)^3$

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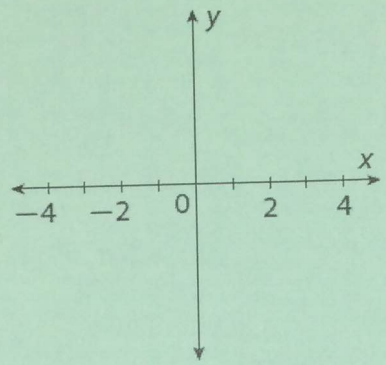
Sketch the graph the polynomial function.

9. $f(x) = x^2(x - 2)$

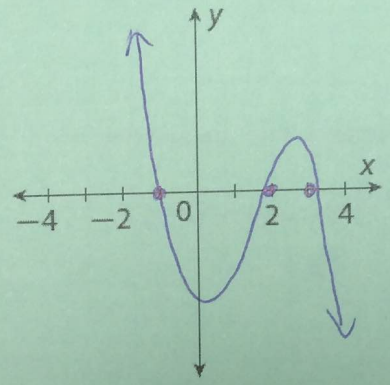
zeros: 0, 2



10. $f(x) = -(x + 1)(x - 2)(x - 3)$

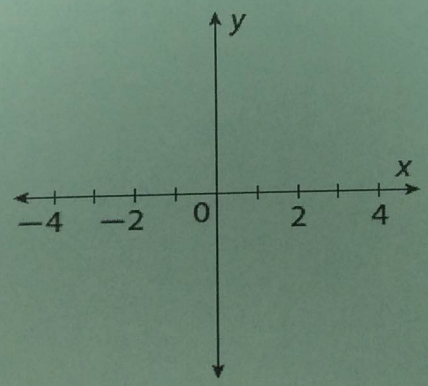
zeros: -1, 2, 3

E.B. ↑↓



11. $f(x) = x(x + 2)^2(x - 1)$

zeros: 0, -2, 1



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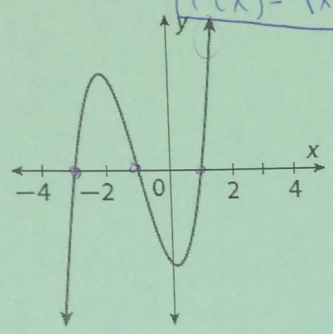
Write a cubic function in intercept form for the given graph, whose x-intercepts are integers. Assume that the constant factor a is either 1 or -1.

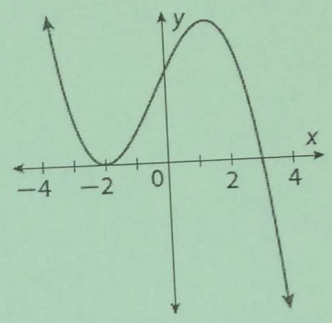
x^3

$f(x) = (x+3)(x+1)(x-1)$

14.



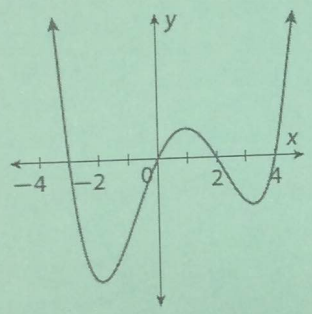
15.



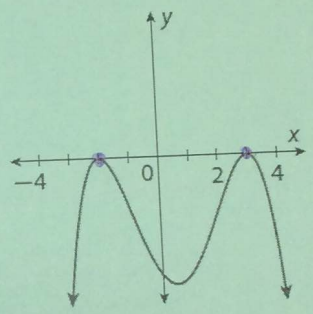
Write a quartic function in intercept form for the given graph, whose x-intercepts are integers. Assume that the constant factor a is either 1 or -1.

x^4

16.



17.



$f(x) = -(x+2)^2(x-3)^2$

19. Explain the Error A student was asked to sketch the graph of the function $f(x) = x^2(x-3)$. Describe what the student did wrong. Then sketch the correct graph.