

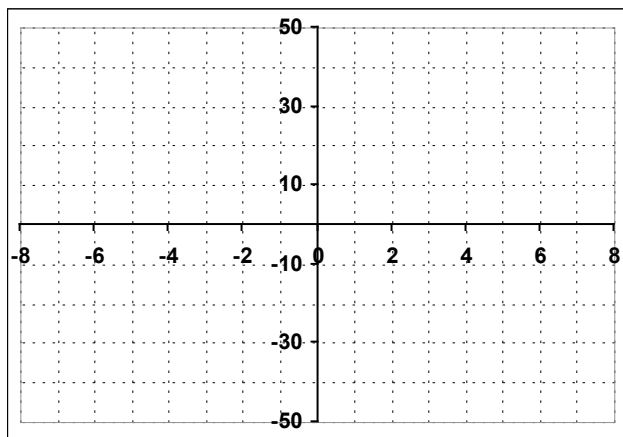
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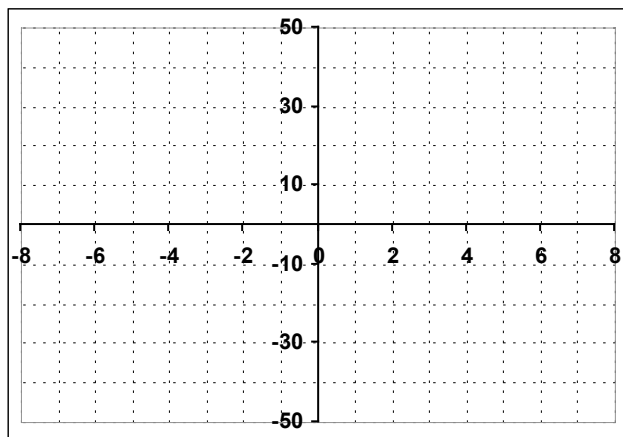
Multiplicity

1. Sketch graphs of the following. You **DO NOT** need to find the y-intercepts. Make sure your end behavior is appropriate, and watch the multiple (double and triple) roots.

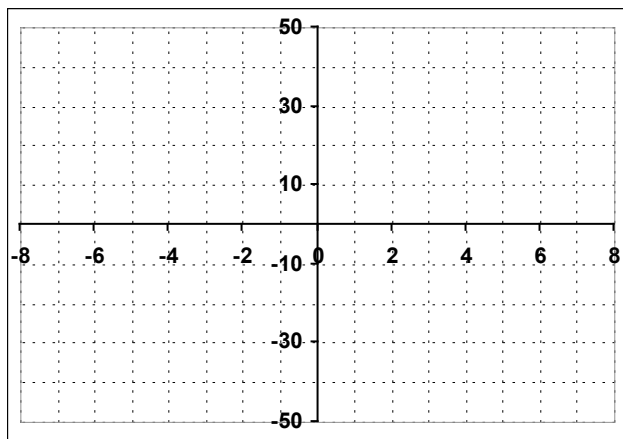
a. $f(x) = -2x(x-1)^2(x+3)$



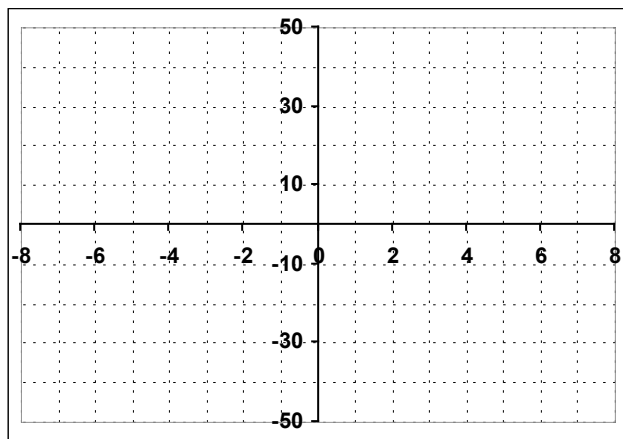
b. $f(x) = 2(x+2)^2(x-3)^2$



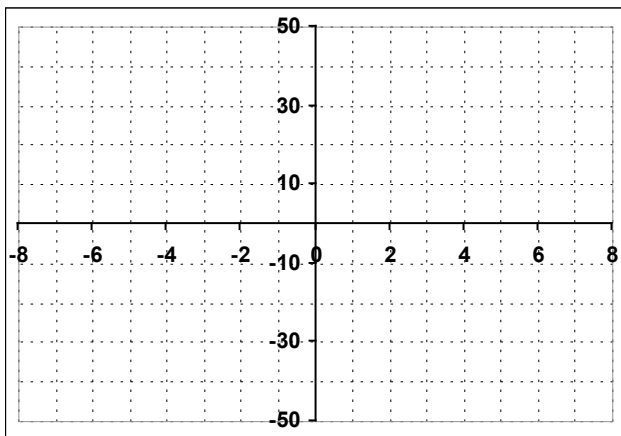
c. $f(x) = -3(x-5)^2(x+3)$



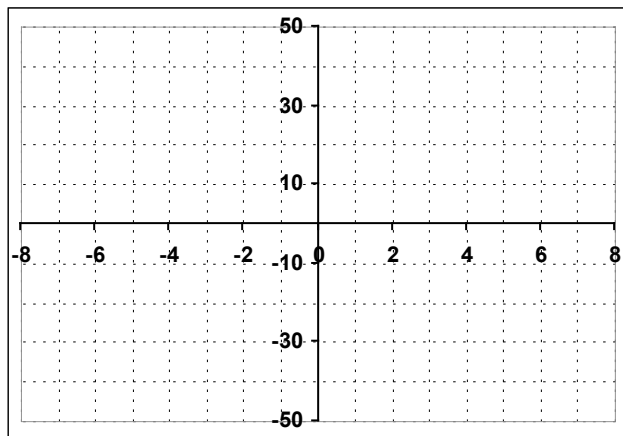
d. $f(x) = -2(x-3)^3(x+2)^2$



e. $f(x) = x^3$



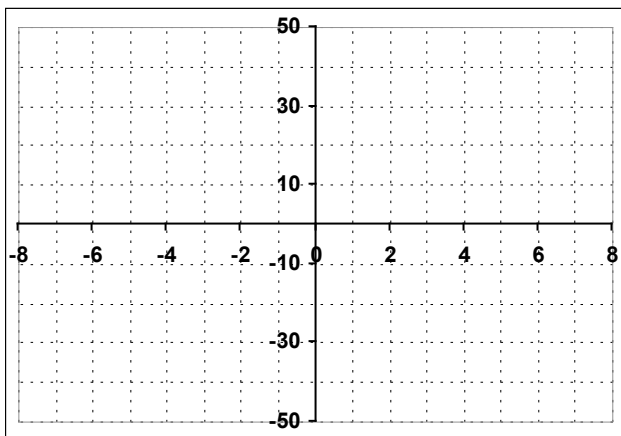
f. $f(x) = 2(x-3)(x+1)(x-5)$



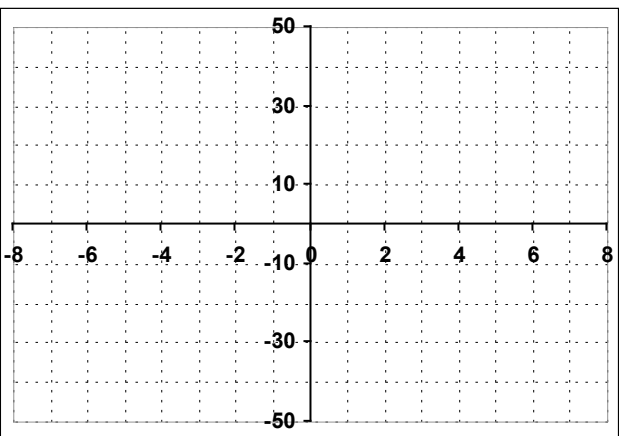
2.

2. Sketch graphs of the following. You **DO NOT** need to find the y-intercepts. Make sure your end behavior is appropriate, and watch the multiple roots. All terms should be factorable.

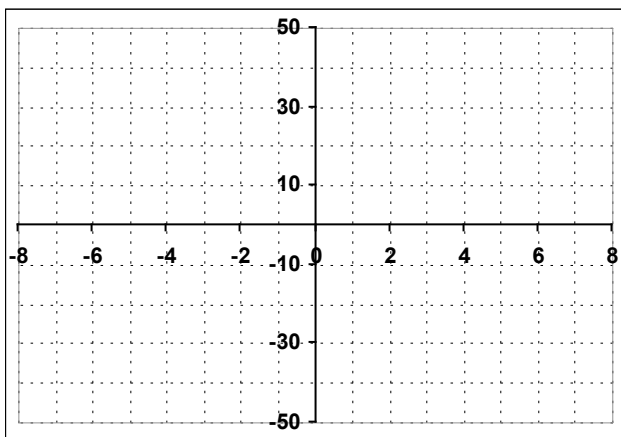
a. $f(x) = x^4 - 3x^3 - 4x^2$



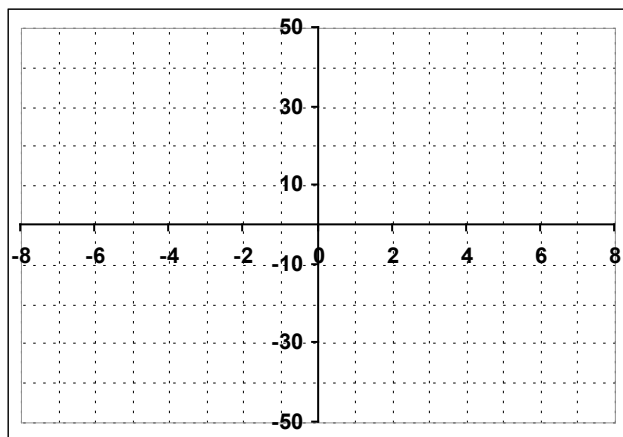
b. $f(x) = 2(x^2 - 9)(x^2 - 2x - 3)$



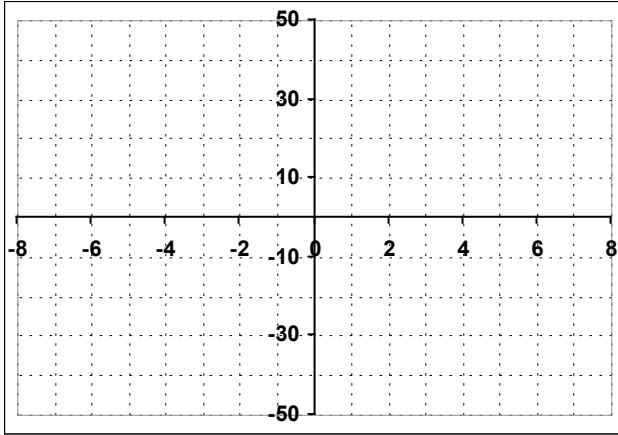
c. $f(x) = -x^5 + 4x^3$



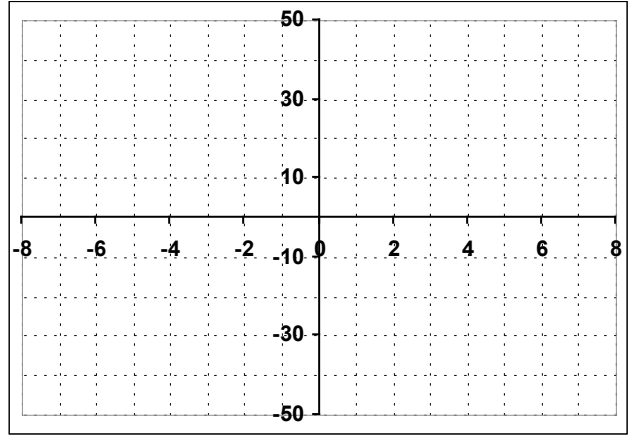
d. $f(x) = (x^3 - x)(x^2 - x - 12)$



e. $f(x) = -2x(x^2 - 5x + 6)(2x^2 - x - 15)$

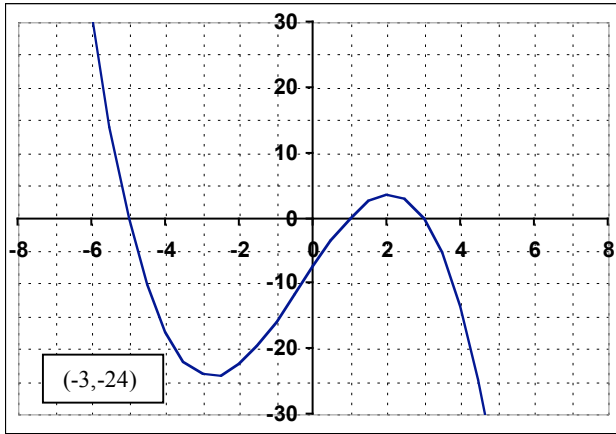


f. $f(x) = (x^2 - 4)^2$

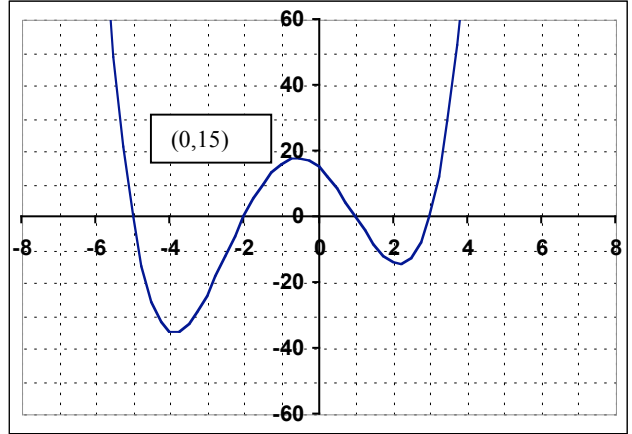


3. Write the equation of each graph below. Use the form $f(x) = a(x - _)(x + _)$... Use the point that is labeled to find the exact value of a . Assume the lowest possible degree (all bounces are doubles...)

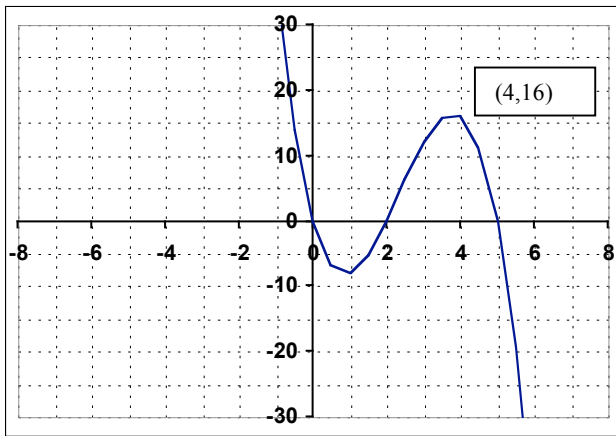
a.



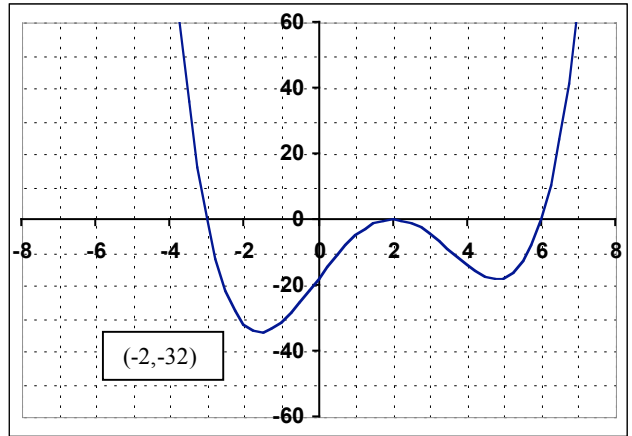
b.



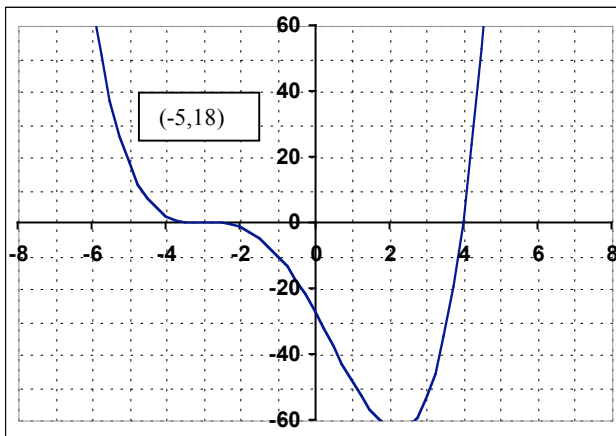
c.



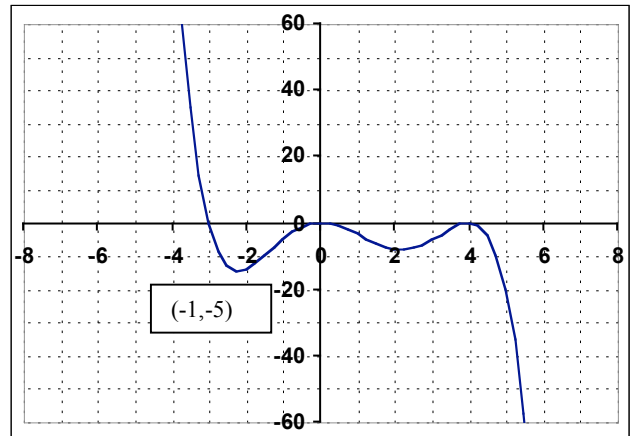
d.



e.



f.



4. Write the equations of the polynomial functions described:

a. A cubic function has zeros of 1, -2, and 3. Its y-intercept is -24.

b. A 4th degree polynomial functions has zeros at ± 1 and ± 2 . It goes through the point (0,8).

c. A 3rd degree polynomial function has zeros of $\pm 2i$ and 3. It goes through the point (-1,40).

Some Answers: 2a. zeros are 0, 0, 4, -1 b. zeros are 3, -3, 3, -1 c. zeros are 0, 0, 0, 2, -2

d. zeros are 0, 1, -1, 4, -3 e. zeros are 0, 2, 3, 3, -2.5 f. zeros are 2, -2, 2, -2

3a. $f(x) = -0.5(x+5)(x-1)(x-3)$ b. $f(x) = 0.5(x+5)(x+2)(x-1)(x-3)$

c. $f(x) = -2x(x-2)(x-5)$

d. $f(x) = 0.25(x+3)(x-2)^2(x-6)$

e. $f(x) = 0.25(x+3)^3(x-4)$

f. $f(x) = -0.1x^2(x+3)(x-4)^2$

4a. $f(x) = -4(x-1)(x+2)(x-3)$

b. $f(x) = 2(x^2-1)(x^2-4)$ or $f(x) = 2(x-1)(x+1)(x-2)(x+2)$

c. $f(x) = -2(x^2+4)(x-3)$