Graphing polynomials Notes Name Key

**You will have to change the y-scale on some of these graphs.

(1) If $f(x)=2(x+4)(x-3)^2$, answer the following and sketch the graph.

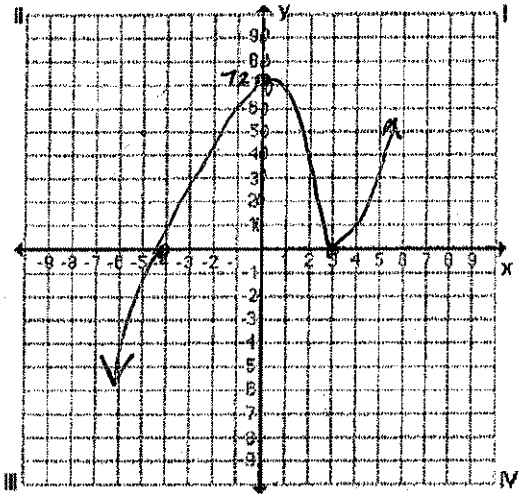
(a) What are the roots? -4, 3 double root

(b) What is the y-intercept? 72

(c) What is the end-behavior?

As $x\to\infty$, $f(x)\to$ ∞

As $x\to-\infty$, $f(x)\to$ $-\infty$



(2) If $f(x)=-3(x-2)(x+5)^2$, answer the following and sketch the graph.

(a) What are the roots? 2, -5 double root

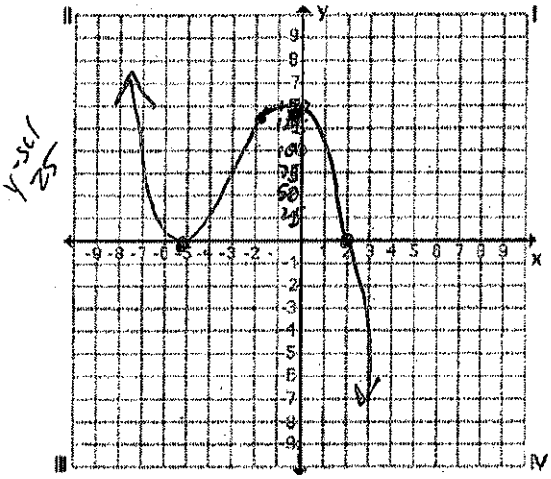
(b) What is the y-intercept? 150

(c) What is the end-behavior?

(-1, 144)

As $x\to\infty$, $f(x)\to$ $-\infty$

As $x\to-\infty$, $f(x)\to$ ∞



(3) If $f(x)=5x^3-45x$, answer the following and sketch the graph. $5x(x^2-9) = 5x(x-3)(x+3)$

(a) What are the roots? 0, 3, -3

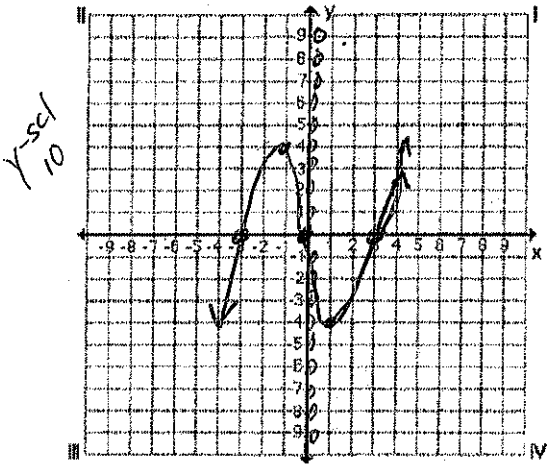
(b) What is the y-intercept? 0

(c) What is the end-behavior?

-5^+

As $x\to\infty$, $f(x)\to$ ∞

As $x\to-\infty$, $f(x)\to$ $-\infty$



(4) If $f(x) = -2(x-2)(x+1)(x+5)^2$, answer the following and sketch the graph.

(a) What are the roots? 2, -1, -5 double root

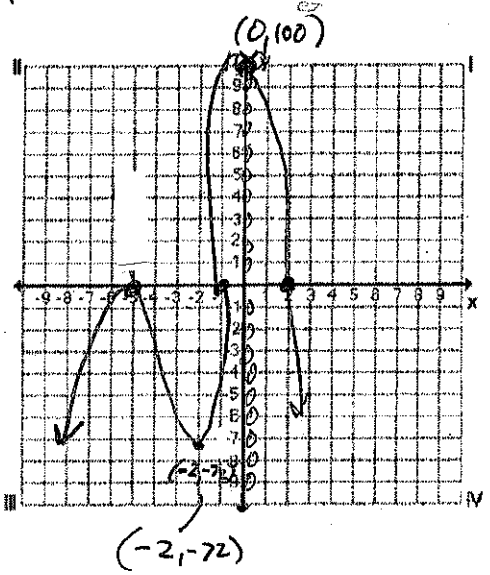
(b) What is the y-intercept? 100

(c) What is the end-behavior?

As $x \to \infty$, $f(x) \to$ $-\infty$

As $x \to -\infty$, $f(x) \to$ $-\infty$

y-scl 10



(5) If $f(x) = 3(x+4)^2(x^2-3)$, answer the following and sketch the graph.

$x^2 = 3$

$x = \pm\sqrt{3}$

$\approx \pm 1.7$

(a) What are the roots? $\pm\sqrt{3}$, -4 double root

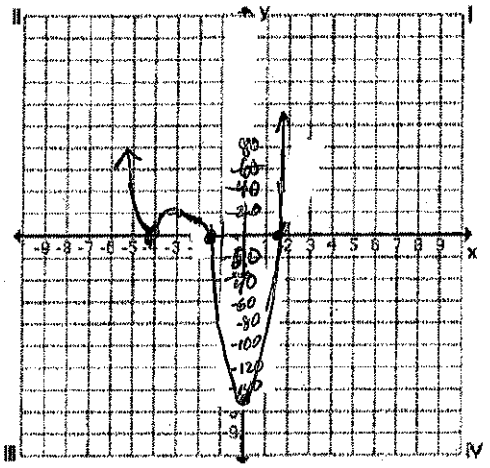
(b) What is the y-intercept? -144

(c) What is the end-behavior?

As $x \to \infty$, $f(x) \to$ ∞

As $x \to -\infty$, $f(x) \to$ ∞

y-scl 20



(6) If $f(x) = (x+1)(x^2-10)$, answer the following and sketch the graph.

(a) What are the roots? $\pm\sqrt{10}$ (±3.16), -1

(b) What is the y-intercept? -10

(c) What is the end-behavior?

As $x \to \infty$, $f(x) \to$ ∞

As $x \to -\infty$, $f(x) \to$ $-\infty$

$-2^2 + (-1)(-2)$