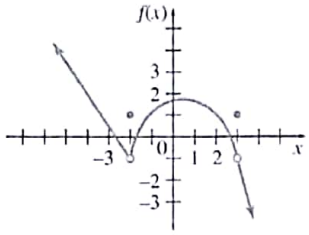
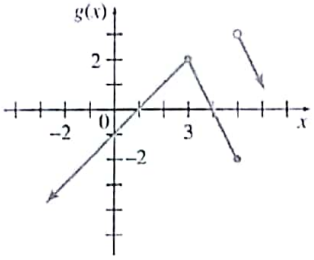
微積分乙(上)第一次期中考　　2018/10/23

1. 5%　Find the average rate of change for $y=\sqrt{3x-2}$ between $x=1$ and $x=2$.

2. 10%　Find all values of a such that the function is discontinuous at $x=a$. For each point of discontinuity, give (a) $f(a)$ if it exists, (b) $\lim_{x\to a^-} f(x)$, (c) $\lim_{x\to a^+} f(x)$, and (d) $\lim_{x\to a} f(x)$.



3. 5%　Find $\lim_{x\to 3} g(x)$ and $\lim_{x\to 5} g(x)$.



4. 5%　Find $\lim_{x\to\infty} \frac{2x^2+5}{5x^2-1}$ and $\lim_{x\to\infty} \frac{x^2+6x+8}{x^3+2x+1}$.

5. 5%　Find the domain of $f(x)=\frac{1}{\sqrt{3x^2+2x-1}}$

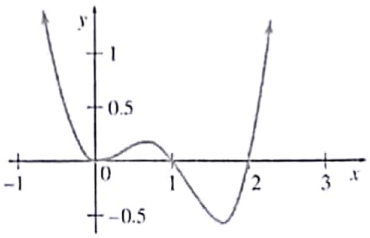
6. 5%　$g(x)=x^2-2x+5$. Find $g(z-p)$.

7. 10%　Graph $f(x)=-\sqrt{2-x}-2$.

8. 5%　Solve $\ln x+\ln 3x=-1$.

9. 10% Let $y = \dfrac{x-4}{x+1}$, find any horizontal and vertical asymptotes and any holes that may exist.

10. 5% The following is the graph of a polynomial. Give the possible values for the degree of polynomial, and give the sign (+ or -) for the leading coefficient)



11. 10% Suppose that $40,000 is borrowed for 4 years at 5% interest. Find the interest paid over this period if the interest is compounded continuously.

12. 5% A firm deposits some funds in a special account at 6% compounded monthly. What effective rate will they earn?

13. 10% How long will it take for $100 to double at an annual inflation rate of 5% compounded continuously?

14. 10% Frank Steed wants to open a camera shop. How much must he deposit now at 6% interest compounded monthly to have $25,000 at the end of 3 years.

$1.001^{12} = 1.012066$ $\quad e^{0.1} \doteq 1.1051$

$1.005^{12} = 1.061678$ $\quad e^{0.2} \doteq 1.2214$

$1.01^{12} = 1.126825$ $\quad e^{0.3} \doteq 1.3458$

$1.06^{12} = 2.012196$ $\quad e^{0.4} \doteq 1.4918$

$\ln(2) = 0.693147, \quad \ln(3) = 1.098612, \quad \ln(5) = 1.609438, \quad \ln(7) = 1.94591$