3-0235 — 50 SHEETS — 5 SQUARES
3-0236 — 100 SHEETS — 5 SQUARES
3-0237 — 200 SHEETS — 5 SQUARES
3-0137 — 200 SHEETS — FILLER
COMET

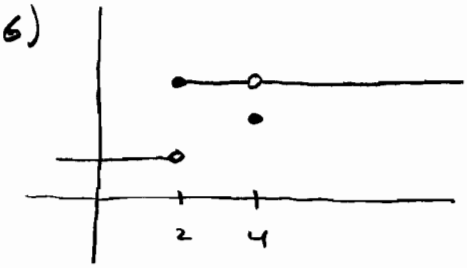
1) $\lim_{x \to 4} f(x) = f(4)$

2) The graph has no holes, jumps or vertical asymptotes

3) f is discontinuous at:

$x = -4$: removeable
$x = -2$: jump
$x = 2$: jump
$x = 4$: infinite

6)



8) a. continuous - temperature changes smoothly over time. There are no jumps.

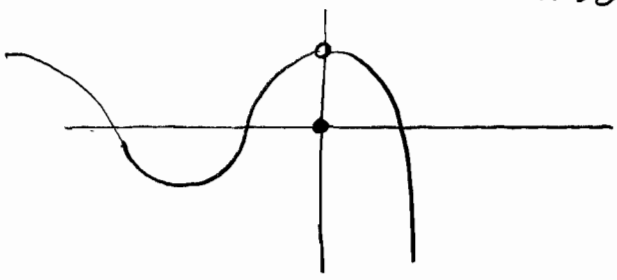
b. continuous - temperature will change smoothly as you move west

c. discontinuous - altitude may jump abruptly, for instance at a cliff.

d. discontinuous - cost increases in discrete amounts

e. discontinuous - as lights are turned on/off, current goes from zero abruptly to a non-zero value.
* This is debatable and could be argued that the change in current is not instantaneous.

19) Discontinuous because $\lim_{x \to 0^-} f(x) \neq f(0)$



3-0235 — 50 SHEETS — 5 SQUARES
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COMET

39) $f(x) = \begin{cases} x+2 & x<0 \\ e^x & 0 \le x \le 1 \\ 2-x & x>1 \end{cases}$

$\lim_{x\to 0} f(x) \stackrel{?}{=} f(0)$ $\quad \lim_{x\to 0^-} f(x) = 2 \quad \lim_{x\to 0^+} f(x) = 1$

$\therefore$ discontinuous at $x=0$

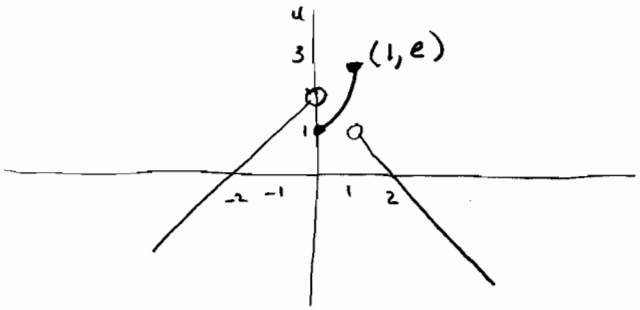
$\lim_{x\to 1} f(x) \stackrel{?}{=} f(1)$ $\quad \lim_{x\to 1^-} f(x) = e \quad \lim_{x\to 1^+} f(x) = 2$

$\therefore$ discontinuous at $x=1$

Since $\lim_{x\to 0^+} f(x) = f(0)$, f is continuous from the right at zero.

Note: $\lim_{x\to 0^-} f(x) \neq f(0)$, therefore <u>not</u> continuous from the <u>left</u> at zero.

Since $\lim_{x\to 1^-} f(x) = f(1)$, f is continuous from the <u>left</u> at one.



47) $f(x) = x^4 + x - 3$

Show there is a root in $(1,2)$

$f(1) = 1^4 + 1 - 3 = -1$

$f(2) = 2^4 + 1 - 3 = 14$

$f(1) < 0$ and $f(2) > 0$ thus, there must be a value c, between 1 and 2, such that $f(c) = 0$.

49) $\cos x = x$
show root in $(0,1)$

Since $\cos x = x$, let $f(x) = \cos x - x$

Show that $f(x)$ has a root in $(0,1)$

$f(0) = \cos 0 - 0$
$= 1$

$f(1) = \cos 1 - 1$
$= -1$

$f(0) > 0$ & $f(1) < 0$, thus there is a $c \in (0,1)$ where $f(c) = 0$.