

10) (i) $mx, [m, x] \rightarrow y \rightarrow [0, 1]$ (ii) $ex - c[x] = y \rightarrow [0, 1]$
 (2) $x - c[x] \rightarrow y \rightarrow [0, 1]$ (3) $y \rightarrow [1, 2] \rightarrow x \rightarrow (-1, 1]$

11) (i) $ax + b = \sqrt{w} \rightarrow R_f = [-\sqrt{w}, \sqrt{w}]$
 (ii) $\sqrt{a^2 + b^2} = \sqrt{w} \rightarrow R_f = [-\sqrt{w}, \sqrt{w}]$
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12) (i) $y = 1 + \cos^2 x \rightarrow R_f = [1, 2]$
 (ii) $y = \sin x \rightarrow R_f = [-1, 1]$
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1. (a) $x > r \rightarrow r x - \varepsilon > 0 \rightarrow y = x + (rx - \varepsilon) = rx - \varepsilon \rightarrow R = [r, +\infty)$
 $x < r \rightarrow r x - \varepsilon < 0 \rightarrow y = x - (rx - \varepsilon) = \varepsilon - x \rightarrow R = (-\infty, r)$
 $\Rightarrow R = [r, +\infty)$

(b) $x > r \rightarrow y = (r - x) + (x - 1) - x = x - 1 \rightarrow R = [-1, +\infty)$

$1 < x < r \rightarrow y = (r - x) + (x - 1) - x = -1 - x \rightarrow R = (-1, -\infty)$

$0 < x < 1 \rightarrow y = (r - x) + (1 - x) - x = 1 - 3x \rightarrow R = [-1, 1]$

$x < 0 \rightarrow y = (r - x) + (1 - x) + x = r - x \rightarrow R = (r, +\infty)$

$\Rightarrow R = [-1, +\infty)$

$r x - r > 0 \rightarrow x > 1 \quad r x + r > 0 \rightarrow x > -1$

$x > 1 \rightarrow K = (rx - r) - (x + r) = rx - x - r - r = r(x - 1) - 2r$

$-1 < x < 1 \rightarrow K = (rx + r) - (x + r) = rx - x = x(r - 1)$

$x < -1 \rightarrow K = (-rx + r) - (-x - r) = -rx + r + x + r = x - rx + 2r$

$\Rightarrow (A) K \geq -r \quad (B) -r < K < r \quad (C) K \geq r$

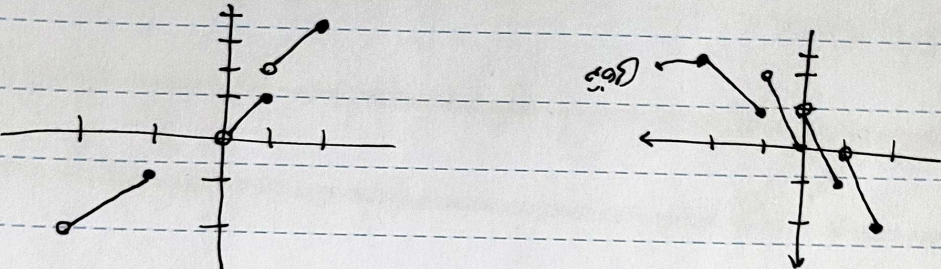
$\frac{r}{2} - 1 < K < \frac{r}{2} + 1$

$\frac{r}{2} - 1 < K < \frac{r}{2} + 1 \Rightarrow K = \frac{r}{2}$

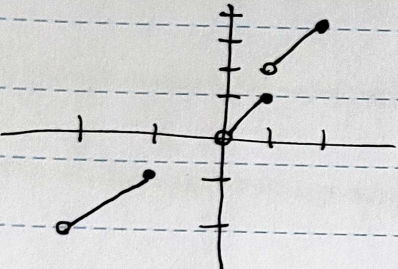
(ii) $x > 0 \rightarrow y = x + 1$
 $x < 0 \rightarrow y = x - 1$

$\Rightarrow (x) = y = x + 1$
 $x < 0 \rightarrow y = x - 1$

Graph etc.



(iii) $-1 < x < 0 \rightarrow [x] = -1$
 $0 < x < 1 \rightarrow [x] = 0$
 $1 < x < 2 \rightarrow [x] = 1$



$\Rightarrow -1 < x < 0 \rightarrow [x] = -1$
 $0 < x < 1 \rightarrow [x] = 0$
 $1 < x < 2 \rightarrow [x] = 1$