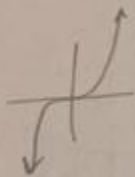


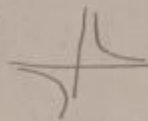
- I
- | | | |
|------|------|-------|
| 1. B | 5. A | 9. C |
| 2. E | 6. C | 10. B |
| 3. C | 7. C | 11. E |
| 4. C | 8. D | 12. B |

II



$D_f: \mathbb{R}$
 $R_f: \mathbb{R}$

III



$D_f: \mathbb{R} - \{0\}$
 $R_f: \mathbb{R} - \{0\}$

IV

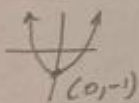


$D_f: \mathbb{R}$
 $R_f: [0, \infty)$

V

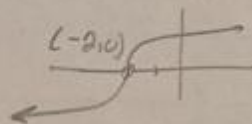
14. $f(x) = x^2 - 1$

shift: $\downarrow 1$
Basic shape:



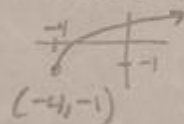
15. $f(x) = \sqrt[3]{x-2}$

shift: $\leftarrow 2$
Basic shape:



16. $f(x) = \sqrt{x+4} - 1$

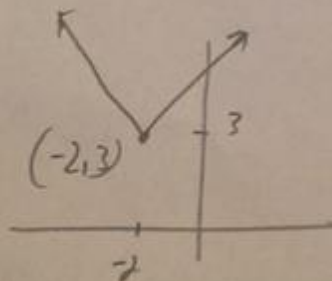
shift: $\leftarrow 4 \downarrow 1$
vertex: $(-4, -1)$
Basic shape:



17. $f(x) = |x+2| + 3$

shift: $\leftarrow 2 \uparrow 3$
vertex: $(-2, 3)$

Basic shape:

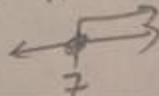


18. $f(x) = \sqrt{x-7}$

we require

$x-7 \geq 0$

$\Rightarrow x \geq 7$



$D_f: [7, \infty)$

#19. $f(x) = \frac{x^3 + x}{5x - 5}$

must exclude:

$$5x - 5 = 0$$

$$\Rightarrow x = 1$$

$$\text{so } D_f = \mathbb{R} - \{1\}$$

(21) $L(x) = \frac{5 - x}{x^2 - 16}$

must exclude

$$x^2 - 16 = 0$$

$$\Rightarrow x^2 = 16$$

$$\Rightarrow x = \pm \sqrt{16}$$

$$= \pm 4$$

$$\text{so } D_f = \mathbb{R} - \{\pm 4\}$$

(20) $f(x) = 3x^2 + 8$

this is a polynomial so

$$D_f = \mathbb{R}$$

(22) $y = f(x-2) + 1$
shift $\leftarrow 2 \uparrow 1$

