ASSIGNMENT #4
OCTOBER 2010
SOLUTIONS

9th Ed. (943-DW ELECTROTECH)

P. 83

#14 $f(x) = 5x - 9$

$f(2) = 5(2) - 9 = \boxed{1}$

$f(-2) = 5(-2) - 9 = \boxed{-19}$

#17 $\phi(x) = \frac{6 - x^2}{2x}$

$\phi(2\pi) = \frac{6 - (2\pi)^2}{2(2\pi)}$

$= \boxed{\frac{6 - 4\pi^2}{4\pi}}$

$\phi(-2) = \frac{6 - (-2)^2}{2(-2)}$

$= \frac{6-4}{-4} = \boxed{-\frac{1}{2}}$

#18 $H(q) = \frac{8}{q} + 2\sqrt{q}$

$H(4) = \frac{8}{4} + 2\sqrt{4}$

$= 2 + 4 = \boxed{6}$

$H(0.16) = \frac{8}{0.16} + 2\sqrt{0.16}$

$= 50 + (0.4)2$

$= \boxed{50.8}$

#20 $S(r) = 6\sqrt{r+11} - 3$

$S(-2) = 6\sqrt{9} - 3$

$= \boxed{15}$

$S(a^2) = \boxed{6\sqrt{a^2+11} - 3}$

#22 $T(t) = 5t + 7$

$T(-2t) = 5(-2t) + 7$

$= \boxed{-10t + 7}$

$T(t+1) = 5(t+1) + 7$

$= \boxed{5t + 13}$

#24 $f(x) = 2x^2 + 1$

$f(x+2) - [f(x) + 2]$

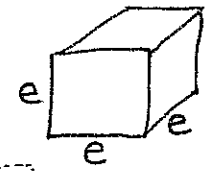
$= 2(x+2)^2 + 1 - [2x^2 + 1 + 2]$

$= 2(x^2 + 4x + 4) + 1 - 2x^2 - 3$

$= 2x^2 + 8x + 8 + 1 - 2x^2 - 3$

$= \boxed{8x + 6}$

#8

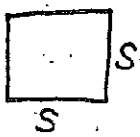


AREA $= 6e^2$

so $e^2 = \frac{A}{6}$

$\boxed{e = \sqrt{A/6}}$

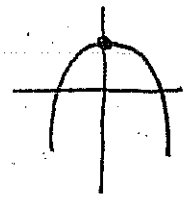
#10



$\boxed{P = 4s}$ $\boxed{s = P/4}$

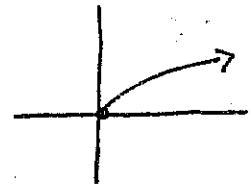
P. 88 #5 $f(x) = x+5$ THIS is a LINE so
DOMAIN : $\mathbb{R}$
RANGE : $\mathbb{R}$

#6 $g(u) = 3-u^2$ QUADRATIC with vertex $(0,3)$
DOMAIN: $\mathbb{R}$
RANGE: $(-\infty, 3]$



#7 $G(R) = \frac{3.2}{R}$ DOMAIN $\mathbb{R} \setminus \{0\}$
RANGE $\mathbb{R} \setminus \{0\}$

#8 $F(r) = \sqrt{r+4}$ DOMAIN: $[-4, \infty)$
RANGE: $[0, \infty)$



#9 $f(s) = \frac{2}{s^2}$ DOMAIN: $\mathbb{R} \setminus \{0\}$
RANGE: $(0, \infty)$

#10 $T(t) = 2t^4 + t^2 - 1$

$= 2t^4 - 2t^2 + t^2 - 1$

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

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

ALWAYS 1 or more — ALWAYS -1 or more

DOMAIN: $\mathbb{R}$
RANGE: $[-1, \infty)$

#11 $H(h) = 2h + \sqrt{h} + 1$

DOMAIN: $[0, \infty)$

RANGE: $[1, \infty)$ → SINCE h CANNOT BE NEGATIVE WE SEE THAT $2h$ & $\sqrt{h}$ WILL NEVER BE NEGATIVE EITHER.

#12 $f(x) = \dfrac{-6}{\sqrt{2-x}}$

DOMAIN: $(-\infty, 2)$

RANGE: $(-\infty, 0)$ (CAN NEVER BE 0 OR POSITIVE BECAUSE OF THE DIVISION & SQUARE ROOT)

#15 $Y(y) = \dfrac{y+1}{\sqrt{y-2}}$ DOMAIN: $(2, \infty)$

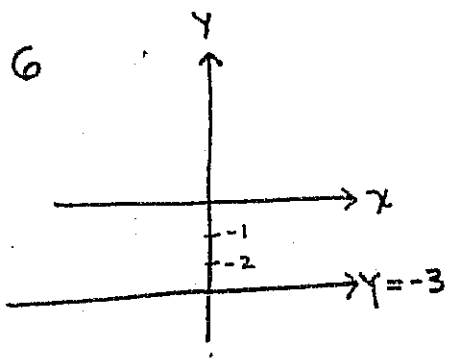
#16 $f(n) = \dfrac{n}{6-2n}$ DOMAIN: $\mathbb{R} \setminus \{3\}$

#17 $f(D) = \dfrac{D}{D-2} + \dfrac{4}{D+4}$ DOMAIN: $\mathbb{R} \setminus \{2, -4\}$

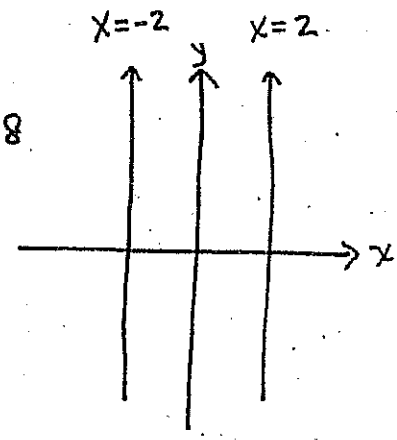
#18 $g(x) = \dfrac{\sqrt{x-2}}{x-3}$ DOMAIN: $[2,3) \cup (3, \infty)$

P. 90

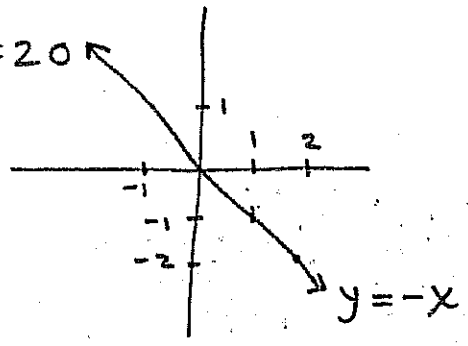
#16



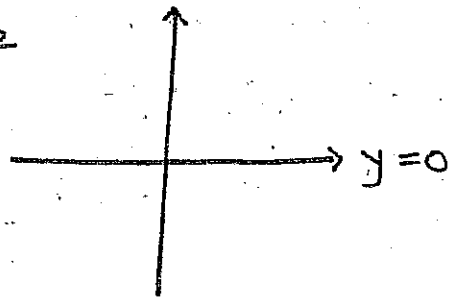
#18



#20



#22



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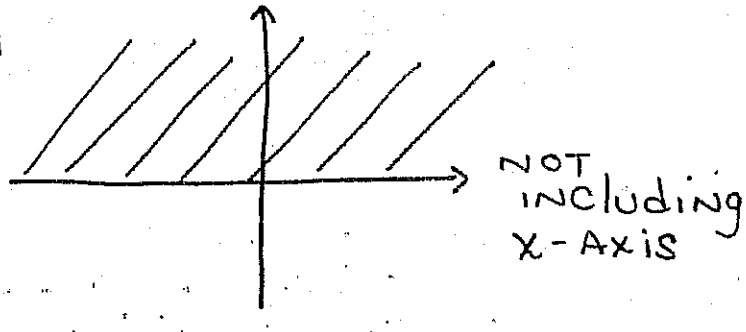
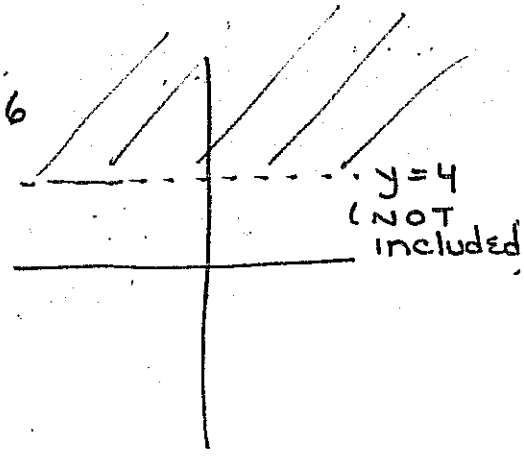
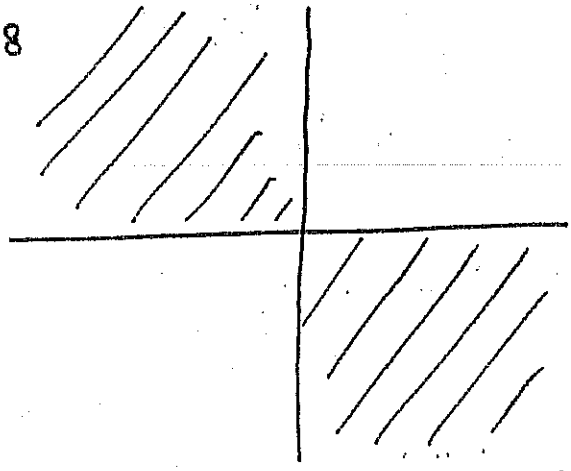


#26



#28



If $y/x < 0$

THIS MEANS
Y & X MUST HAVE
OPPOSITE SIGNS

(NOT INCLUDING AXES)

P. 2

#10 $y = x^2 + 3x$

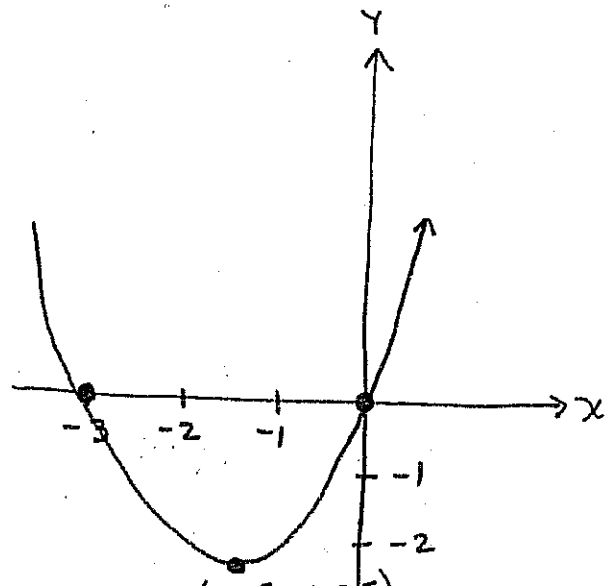
$= x(x+3)$

y INTERCEPT $x=0$ $y=0$

x INTERCEPTS $y=0$ $x=0$
$x=-3$

VERTEX $x = \frac{-3}{2} = -1.5$

$y = -1.5\,(1.5)$



12 $u = -3v^2 + 12v - 5$

v-intercepts $u = 0$

$$v = \frac{-12 \pm \sqrt{12^2 - 4(-3)(-5)}}{2(-3)}$$

$$= \frac{-12 \pm \sqrt{144 - 60}}{-6}$$

$$= \frac{-12 \pm \sqrt{84}}{-6} = \frac{-12 \pm 2\sqrt{21}}{-6}$$

$$v = \frac{2 \pm \sqrt{21}}{3} \approx 3.53 \text{ \& } 0.47$$

u intercept $v = 0$ $u = -5$

Vertex $v = \frac{-12}{2(-3)} = 2$ $u = -3(2)^2 + 12(2) - 5$

$= -12 + 24 - 5$

$= 7$

$(2, 7)$