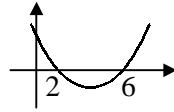


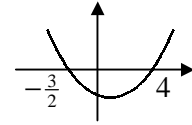
1 a $4 > \frac{3}{2}y$
 $y < \frac{8}{3}$

b $(x-2)(x-6) \geq 0$



$\therefore x \leq 2$ or $x \geq 6$

2 $2n^2 - 5n - 12 < 0$
 $(2n+3)(n-4) < 0$



$-\frac{3}{2} < n < 4$

n integer $\therefore n = -1, 0, 1, 2, 3$

3 a $(x+8) \geq 1.5 \times x$
 $8 \geq 0.5x$
 $x \leq 16$

b $x(x+8) \geq 180$

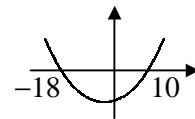
$x^2 + 8x - 180 \geq 0$

$(x+18)(x-10) \geq 0$

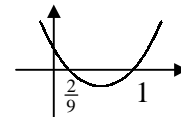
$x \leq -18$ or $x \geq 10$

but $x > 0$ (width > 0)

and $x \leq 16 \therefore 10 \leq x \leq 16$



4 $9x^2 - 6x + 1 < 5x - 1$
 $9x^2 - 11x + 2 < 0$
 $(9x-2)(x-1) < 0$



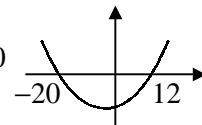
$\frac{2}{9} < x < 1$

5 $x = y + 8$

sub. $y(y+8) \leq 240$

$y^2 + 8y - 240 \leq 0$

$(y+20)(y-12) \leq 0$

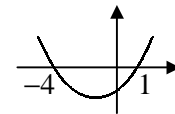


$-20 \leq y \leq 12$

$x + y = y + 8 + y = 2y + 8$

\therefore max value of $(x+y) = 2(12) + 8 = 32$

6 $3t^2 - 11t - 4 \geq 2t^2 - 14t$
 $t^2 + 3t - 4 \geq 0$
 $(t+4)(t-1) \geq 0$



$t \leq -4$ or $t \geq 1$

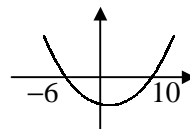
7 a $2x^2 + 2x - kx + 8 = 0$
 real and distinct roots
 $\therefore b^2 - 4ac > 0$

$(2-k)^2 - 64 > 0$

$4 - 4k + k^2 - 64 > 0$

$k^2 - 4k - 60 > 0$

b $(k+6)(k-10) > 0$



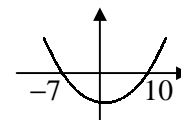
$k < -6$ or $k > 10$

8 let height be $h \therefore h^2 = (3r-4)^2 - r^2$
 but $h \leq 24$
 $\therefore h^2 \leq 24^2$

$(3r-4)^2 - r^2 \leq 576$

$r^2 - 3r - 70 \leq 0$

$(r+7)(r-10) \leq 0$



$-7 \leq r \leq 10$

\therefore maximum value of $r = 10$