Q1. (a)

$$\frac{3^2 - 2^3}{2^3 - 3^2} = \frac{9 - 8}{8 - 9}$$
$$= \frac{1}{-1}$$
$$= -1$$

(b)

$$\sqrt{\sqrt{81} + \sqrt{9} - \sqrt{64}} = \sqrt{9 + 3 - 8}$$
$$= \sqrt{4}$$
$$= 2$$

(c)

$$\frac{1}{\sqrt{x^2 + 7}} = \frac{1}{4}$$
$$\sqrt{x^2 + 7} = 4$$
$$x^2 + 7 = 16$$
$$x^2 = 9$$
$$x = \pm 3$$

Q2. (a) $1 < a < b$ and $ab = 2022$

- $(2, 1011)$
- $(3, 674)$
- $(6, 337)$

(b)
$$\frac{2c+1}{2d+1} = \frac{1}{17}$$
$$2d + 1 = 17(2c + 1)$$
$$2d + 1 = 34c + 17$$
$$2d = 34c + 16$$
$$d = 17c + 8$$

$$d > 0$$
$$17c + 8 > 0$$
$$17c > -8$$
$$c > \frac{-8}{17}$$

$$d = 17c + 8$$
$$17c = d - 8$$
$$c = \frac{d - 8}{17}$$

$$c > 0$$
$$\frac{d - 8}{17} > 0$$
$$d - 8 > 0$$
$$d > 8$$

$\therefore$ the lowest value d can be is 8

(c) $(px + r)(x + 5) = x^2 + 3x + t$

As $a = 1$ then $p = 1$

let $t = 5r$, as $b = 3$ then $5 + r = 3$

$$5 + r = 3$$
$$r = -2$$

As $t = 5r$ then $t = 5(-2)$ or $t = -10$

Q3.   (a)

      (b)

      (c)

Q4. (a)

(b)

(c)

Q5. (a)

(b)

(c)

Q6. (a)

     (b)

     (c)

Q7. (a)

(b)

(c)

Q8. (a)

(b)

(c)

Q9. (a)

(b)

(c)

Q10. (a)

     (b)

     (c)