

Q1.

a) Simplify the following radical expressions.

(i)

$$\frac{200 + 20\sqrt{5}}{3 + \frac{2 - (3\sqrt{5})}{\sqrt{5}}}$$

(ii) $\frac{10000^{\frac{1}{2}}}{20\sqrt{5}}$

(iii) $4(8^{\frac{1}{3}} - 4^{\frac{1}{2}})$

Q2 Solve the following equation

$$\frac{5x(x-1)}{8x-8} - 2(-1+x) = \frac{3x^2}{(x^3)^{1/3}}$$

Q3 Solve the following equations for values of x and y (feasible region).

$$\frac{4y - x}{x - y} \geq 30$$

$$x - \frac{(3x^2)}{x} + \sqrt{(y-1)^2} \geq 0$$

Q4 A crazy angle in a triangle can choose whatever angle it wants to be, ranging from 0° to 90° . Answer the following questions.

(i) If it chooses what to be by asking a smart kid to pick a number ^{randomly} between 0 and 1 and the angle becomes x , such that ~~that~~ $\sin x =$ the number picked by the kid, then what is the probability that the angle is going to be less than or equal to 30° ?

(ii) If the angle becomes x such that $\frac{x}{100} = \frac{90}{100} \times$ (the ^{random} number chosen by the kid), what is the probability that x is going to be less than or equal to 30° ?

Q5 If 30 kids can build 15 toy homes in 21 days, and daddys are twice as fast in building toy homes,

(i) how many toy homes can 10 daddys build in 10 days?

(ii) how many daddys are needed to build 15 toy homes in 7 days?

Q6 If the population of ants in a mound doubles every two days and these ants live for 3 years,

(i) If on day 1, there are 20 ants, how many ants will there be at the end of 10th day?

(ii) What is the compounding rate of growth of ants per "2-days"?