SOLUTIONS

Yr 11 : Revision 3 : No Calculator

1) Express $x = 0.7\dot{8}$ as a fraction

$10x = 7.\dot{8}$

$100x = 78.\dot{8}$

sub $90x = 71$

$x = 71/90$

2) Evaluate

a) $9^{-1/2} = \frac{1}{9^{1/2}} = \frac{1}{\sqrt{9}} = \frac{1}{3}$

b) $\left(\frac{1}{8}\right)^{-2/3} = \left(\frac{8}{1}\right)^{2/3} = \left(8^{1/3}\right)^2 = \left(\sqrt[3]{8}\right)^2 = (2)^2$

$= 4$

3) Simplify these surds in the form $a\sqrt{b}$

a) $\sqrt{8} = \sqrt{4 \times 2} = \sqrt{4}\sqrt{2} = 2\sqrt{2}$

b) $\sqrt{200} = \sqrt{100 \times 2} = \sqrt{100}\sqrt{2} = 10\sqrt{2}$

c) $\sqrt{75} = \sqrt{25 \times 3} = \sqrt{25}\sqrt{3} = 5\sqrt{3}$

4) Evaluate, simplifying your answer

a) $(\sqrt{3} + \sqrt{2})(\sqrt{3} - \sqrt{2})$

$= 3 - \sqrt{6} + \sqrt{6} - 2$

$= 1$

b) $(3\sqrt{2} + \sqrt{3})^2$

$= (3\sqrt{2} + \sqrt{3})(3\sqrt{2} + \sqrt{3})$

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

$= 21 + 6\sqrt{6}$

5) A bag contains 3 green and 2 yellow beads. 2 beads are removed at random.

a) Calculate the probability they are both yellow

$P(Y \text{ and } Y) = \frac{2}{5} \times \frac{1}{4}$

$= \frac{2}{20} = \frac{1}{10}$

b) Calculate the probability that at least one green is pulled out

$P(G \text{ and } Y \text{ OR } Y \text{ and } G \text{ OR } G \text{ and } G)$

$= \left(\frac{3}{5} \times \frac{2}{4}\right) + \left(\frac{2}{5} \times \frac{3}{4}\right) + \left(\frac{3}{5} \times \frac{2}{4}\right)$

$= \frac{6}{20} + \frac{6}{20} + \frac{6}{20} = 18/20 = 9/10$

Better be

OR $P(Y \text{ and } Y$

$= \frac{2}{5} \times \frac{1}{4} =$

$\therefore P(\text{at least one}$

Partner fraction $\Rightarrow = \frac{18}{20} =$

6) Write these as a single fraction

a) $\frac{3}{x+1} + \frac{2}{3x-1}$

$= \frac{3(3x-1)}{(x+1)(3x-1)} + \frac{2(x+1)}{(x+1)(3x-1)}$

$= \frac{9x-3+2x+2}{(x+1)(3x-1)} = \frac{11x-1}{(x+1)(3x-1)}$

b) $\frac{2}{x+a} \quad \frac{1}{x}$

$= \frac{2x}{x(x+a)} - \frac{1(x+a)}{x(x+a)} = \frac{2x-x-a}{x(x+a)} = \frac{x-a}{x(x+}$

7) Solve the equations

$\frac{2}{x+1} + \frac{1}{x-1} = 1$

LCM $= (x+1)(x-1)$

$\times (x+1)(x-1)$ $\quad \frac{2(x-1)}{(x+1)(x-1)} + \frac{1(x+1)}{(x+1)(x-1)} = \frac{1(x+1)(x-1)}{(x+1)(x-1)}$

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

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

$0 = x^2-3x$

$0 = x(x-3)$

either $x=0$ or $x-3=$ $x=3$

8) Complete the table below showing the points on the curve $y = 2x^2+x-1$

x	-4	-3	-2	-1	0	1	2	3
y	29	14	5	0	-1	2	9	20

$x=-2$

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

$y = 2(4)-2-1$

$y = 5$

$x=3$

$y = 2(3^2)+3-1$

$y = 18+3-1$

$y = 20$