17/08/21

Holiday Homework.

1) $\frac{7}{20\times25} = \frac{1}{2^2\times5\times52}$, (a) after two decimal places.

(2) $\frac{63}{72\times175} = \frac{3^2\times7}{2^3\times3^2\times5^2\times7}$, (a) terminating.

(3) $9696 \times 4 = 38784$, (d) 38784.

(4) (a) $a \times b$

(5) (b) relatively prime or co-prime.

(6) x^2+x+1, here- $a=1, b=1, c=1$. $\frac{1}{\alpha}+\frac{1}{\beta} = \frac{\beta+\alpha}{\alpha\beta} = \frac{-1}{1} = -1$., (c) -1.

(7) (b) x^2+3x+2.

(8) $px^2-2x+3p$, $a=p, b=-2, c=3p$. $\alpha+\beta = \alpha\beta$

$\Rightarrow \frac{-(-2)}{p} = \frac{3p}{p} \Rightarrow 2 = \frac{3p}{p} \times p$

$\Rightarrow \frac{2}{3} = p$.

(b) $\frac{2}{3}$

(9) $x^2+3x+k=0$

$\Rightarrow (2)^2+3(2)+k=0 \Rightarrow 4+6+k=0 \Rightarrow 10+k=0 \Rightarrow k=-10$.

(b) -10

(10) $19x-17y=55$

$-17x-19y=53$

$2x-2y=2$

$\Rightarrow 2(x-y)=2$

$(x-y)=1$, (a) 1.

(11) $\frac{2}{x}+\frac{3}{y}=13$

$\frac{5}{x}-\frac{4}{y}=-2$ Here, we will take $\frac{1}{x}$ as u and $\frac{1}{y}$ as v

(12) $\frac{2}{4}=\frac{3}{K}=\frac{5}{10}\neq\frac{1}{2}$ $\frac{3}{K}=\frac{1}{2}\Rightarrow 6=K$. (b) 6.

$\therefore 2u+3v=13$ — (i)

$5u-4v=-2$ — (ii)

from eq (i), we can take $2u+3v=13$

$\Rightarrow 2u=13-3v \Rightarrow u=\frac{13-3v}{2}$ — (iii)

Now substituting the value of u in eq (ii)

$5\left(\frac{13-3v}{2}\right)-4v=-2$.

$\Rightarrow 5\left(\frac{13-3v}{2}\right)\times 2-4v\times 2=-2\times 2$ multiplying 2 on both the sides.

$\Rightarrow 65-15v-8v=-4$

$\Rightarrow 65-19v=-4$

$\Rightarrow -19v=-4-65=-69$

$\Rightarrow v=\frac{-69}{-23}=3$.

$\therefore v=3$.

now, substituting value of v in eq (iii)

$u=\frac{13-3(3)}{2}=\frac{13-9}{2}=\frac{4}{2}=2$.

$u=\frac{1}{x} \Rightarrow x=\frac{1}{u}=\frac{1}{2}$

$v=\frac{1}{y} \Rightarrow y=\frac{1}{v}=\frac{1}{3}$

$\therefore x+y=\frac{1}{2}+\frac{1}{3}=\frac{3+2}{6}=\frac{5}{6}$.

(12) $\frac{2}{4}=\frac{3}{K}=\frac{5}{10}=\frac{1}{2} \Rightarrow \frac{3}{K}=\frac{1}{2} \Rightarrow 3(2)=K \Rightarrow K=6$.

(b) 6.

(13) $\frac{k}{6} = \frac{5}{2} \Rightarrow 2k = -30 \Rightarrow k = \frac{-30}{2} = -15$

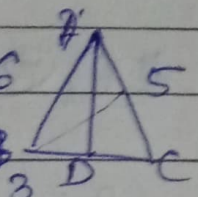
(d) -15

(14) $\frac{1}{-3} = \frac{2}{-6} \neq \frac{5}{1}$ ∴ (d) no solution.

(15) (c) intersecting or coincident.

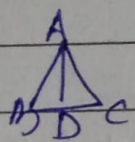
(16) (a) $\Delta PQR \sim \Delta CAB$

(17) $\frac{AB}{BD} = \frac{AC}{CD}$ $\frac{6}{3} = \frac{5}{DC} \Rightarrow 2DC = 5 \Rightarrow DC = \frac{5}{2} = 2.5$

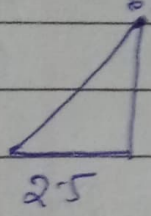


(b) 2.5 cm

(18) (b) $4DC^2$



(19) (d) 6.5m



20. (d) 20cm.

(21) $\frac{30}{15} = \frac{x}{75} \Rightarrow 15x = 225 \Rightarrow x = \frac{2250}{15} = 150$ m.

(22) $180° - (47° + 83°) = 180° - 130° = 50°$

(a) 50°

(23) $\frac{-2+8}{2} = \frac{6+x}{2} \Rightarrow 6 = 6 + x = x = 0.$

$\frac{3+2}{2} = \frac{7+y}{2} \Rightarrow 6 = 7 + y \Rightarrow 6 - 7 = y \Rightarrow y = -1.$

D(0, -1)

25. $\frac{7K-2}{K+1} = 1 \Rightarrow 7K-2 = K+1 \Rightarrow 7K-K = 3 \Rightarrow K = \frac{3}{6} = \frac{1}{2}$

(d) 1 : 2.

26. D = mid point of BC $= \frac{-3+1}{2}, \frac{-1-1}{2} = \left(\frac{-2}{2}, \frac{0}{2}\right)$

$= (-1, 0)$.

~~$\sqrt{(5)^2+(2)^2} = 25+4 = \sqrt{29}$~~

$AD = \sqrt{(-1-5)^2+(0-1)^2} = \sqrt{(6)^2+(1)^2} = \sqrt{36+1} = \sqrt{37}$ units

(b) $\sqrt{37}$ units.

27. $Am = \sqrt{(2a+\sqrt{3}a-2a)^2+(5a-6a)^2}$

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

$= \sqrt{3a^2+a^2}$

$= \sqrt{4a^2}$

$= 2a$.

(b) $2a$.

28. $\sqrt{(-a-a)^2+(-b-b)^2} \sqrt{(-2a)^2+(-2b)^2} = \sqrt{4a^2+4b^2}$

$= 2a+2b = 2(a+b)$

(b) $2(a+b)$

29) $\sin A + \sin^2 A = 1$

$\Rightarrow \sin A (1+\sin A) = 1$.

$\Rightarrow \cos^2 A (1+\sin A) = (1+\sin A)$

$\Rightarrow \cos A = \sin A$

$\therefore (\cos^2 A + \cos^4 A) = (\sin^2 A + \sin^2 A)^2$

$= (1)^2$

$= 1$

(30) $\sec\theta + \tan\theta = m$

$\sec^2\theta - \tan^2\theta = 1$

$(\sec\theta - \tan\theta)(\sec\theta + \tan\theta) = 1$

$\Rightarrow (\sec\theta - \tan\theta)\, m = 1$

$\Rightarrow \sec\theta - \tan\theta = 1 - m$

(31) $\frac{\sin\theta}{1+\cos\theta} = \frac{1+\cos\theta}{\sin\theta} \times$

(21) $\frac{\sin\theta}{1+\cos\theta} = \frac{\sin\theta \times (1-\cos\theta)}{(1+\cos\theta)(1-\cos\theta)} = \frac{1-\cos\theta \times \sin\theta}{\sin^2\theta}$

$= \frac{1-\cos\theta}{\sin\theta}$

(32) $\sec(A+B) = \sec 90^\circ =$ (d) not defined.

(33) $\sin 2A = 2\sin A \cos A$

$\Rightarrow 2\sin A \cos A - \sin 2A = 0$

$\Rightarrow 2\sin A (\cos A - 1) = 0$

$\Rightarrow \sin A = 0$ or $\cos A = 1$.

$\Rightarrow A = 0,$

(34) $\sin A = \frac{1}{2} \Rightarrow A = 30^\circ$

$\therefore 3\cos A - 4\cos^3 A = 3\cos(30^\circ) - 4\cos^3 30^\circ$

$= 3 \times \frac{\sqrt{3}}{2} - 4 \times \left(\frac{\sqrt{3}}{2}\right)^3 \times \frac{\sqrt{3}}{2} \times \frac{\sqrt{3}}{2}$

$= \frac{3\sqrt{3}}{2} - \frac{3\sqrt{3}}{2} = 0.$

(a) 0.

(35) $a\cot\theta + b\operatorname{cosec}\theta = p$ and $b\cot\theta + a\operatorname{cosec}\theta = q$

$(a\cot\theta + b\operatorname{cosec}\theta)^2 - (a\operatorname{cosec}\theta + b\cot\theta)^2$

$= a^2\cot^2\theta + b^2\operatorname{cosec}^2\theta + 2ab\cot\theta\operatorname{cosec}\theta - a^2\operatorname{cosec}^2\theta - b^2\cot^2\theta - 2ab\operatorname{cosec}\theta\cot\theta = a^2\cot^2\theta - a^2\operatorname{cosec}^2\theta + b^2\operatorname{cosec}^2\theta - b^2\cot^2\theta$

$= -a^2[\operatorname{cosec}^2\theta - \cot^2\theta] + b^2[\operatorname{cosec}^2\theta - \cot^2\theta]$

$= b^2 - a^2.$

(39) $2\pi x = \pi x^2 \Rightarrow x = 2$ i.e $d = 2 \times 2 = 4$.

(40) $r = \sqrt{7}$ cm, $\theta = 10°$. $\frac{\theta}{360°} \times \pi r^2 = \frac{10}{360} \times \frac{22}{7} \times \sqrt{7} \times \sqrt{7}$ cm^2

$= \frac{22}{36} = \frac{11}{18}$ cm^2

(41) $\frac{45°}{360°} \times 2\pi a = \frac{1}{8} \times 2\pi a = \frac{\pi}{4} a$ cm. (c) $\frac{\pi}{4} a$ cm.

(42) (b) 14 : 11

(43) (d) 9π cm^2

(44) $\frac{\theta}{360°} \times 2\pi(4\text{cm}) = 4\pi$ cm $\Rightarrow \frac{\theta}{360°} \times 8\pi$ cm $= 4\pi$ cm

$\Rightarrow \theta = \frac{4\pi \text{ cm} \times 360°}{8\pi \text{ cm}} = 180°$.

(44) $\frac{\theta}{360°} \times 8\pi$ cm $= 4\pi$ cm $\Rightarrow \theta = \frac{4\pi \text{ cm} \times 90°}{2\pi \text{ cm}} = 180°$

(45) $\frac{4}{52} = \frac{1}{13}$ (b) $\frac{1}{13}$

(46) $\frac{9}{36} = \frac{1}{4}$ (c) $\frac{1}{4}$

(47) (b) 50

(48) $\frac{p}{12}+\frac{3}{4}=1 \Rightarrow \frac{p+9}{12}=1 \Rightarrow p+9=12 \Rightarrow p=12-9=3$

(c) 3.

(49) (d) 0

(50) (b) $\frac{2}{52}=\frac{1}{26}$

(51) (c) $n^2+\frac{1}{n^2}+7$.

(52) (d) $3n^2-3n+1$

(53) (b) 3

(54) $\alpha+\beta+\alpha\beta=-\frac{b}{a}+\frac{c}{a}$

$=\frac{-5}{2}+\frac{1}{2}=\frac{-4}{2}=-2$.

(a) -2.

(55) ~~$\alpha+\beta=-\frac{b}{a}=\frac{-(-1)}{2}=\frac{1}{2}$~~

(55) $\alpha+\beta=-\frac{b}{a}=\frac{-(-3)}{-1}=\frac{3}{-1}=-3$

(d) none of these.

(56) (c) $\frac{n^2}{2}-\frac{n}{2}-6$

(57) $f(x)=0$.

(58) (b) 3

(59) (a) n^2+n-12.

(60) (b) $\frac{c}{a}$

(61) $180^\circ-(32^\circ+65^\circ)$

$=180^\circ-97^\circ=83^\circ$

(62) (d) $180^\circ-(47^\circ+83^\circ)=180^\circ-130^\circ$

$=50^\circ$

(63) (b) $180^\circ-(80^\circ+60^\circ)=180^\circ-130^\circ=50^\circ$

(64) (a) $\frac{80\,cm^2}{n}=\frac{4}{5} \Rightarrow \frac{20\,cm^2\times 5}{4}=n$

$\Rightarrow 100\,cm^2=n$.

(65) (a) $180^\circ-(47^\circ+83^\circ)=180^\circ-130^\circ=50^\circ$

(66) $\frac{AM^2}{PQ^2}=\frac{100}{144} \Rightarrow \frac{AM}{PQ}=\frac{\sqrt{100}}{144}=\frac{10}{12}$.

$\Rightarrow \frac{10}{12}=\frac{AM}{PN}=\frac{10}{12}=\frac{4}{PN} \Rightarrow PN=\frac{4\times 12}{10}$

$=4.8$.

(67) $\frac{6}{4}=\frac{n}{28} \Rightarrow \frac{6\times 28}{4}=n \Rightarrow n=42$ cm.

(a) 42m.

(68) ~~$\frac{2.25}{6.25}=\frac{AM^2}{PQ^2}$~~

(68) $\frac{2.25}{6.25}=\frac{AM^2}{PQ^2}$

$\Rightarrow \frac{1.5}{2.5}=\frac{AM}{0.5} \Rightarrow \frac{1.5\times 0.5}{2.5}=AM$

$=0.3m$.

$=30cm$

(69) (c) 8

(70) (b) 1