Date : 11 - 12 - 2016
Std. : VIIIth Std.

GANIT PRABHUTWA EXAMINATION
SOLUTIONS

Q. 1 (C)

$\square PQRS$ is cyclic Quadratic

$\therefore$ Sum of opposite angles is 180^o.

$\Rightarrow \angle P + \angle R + 180^o$

$\Rightarrow 2x + 50 + x - 30 = 180$

$\Rightarrow 4x = 160$

$x = 40^o$

$\angle R = 2x - 30$

$= 80 - 30$

$= 50^o$

2. (B)

$(6.2) \times 10^{12} \div (5 \times 10^{11})$

$= \frac{6.2}{5} \times 10^{12-11}$

$= \frac{62}{5}$

3. (B)

64 % of 1600 = 80% of x

$\Rightarrow \frac{64}{100} \times 1600 = \frac{80}{100} \times x$

$\Rightarrow x = 1280$

4. (A)

$a : b = 4 : 7$ $\qquad$ $b : c = 5 : 8$

$\frac{a}{b} = \frac{4}{7}$ $\qquad$ $\frac{b}{c} = \frac{5}{8}$

$$a:c=\frac{a}{c}=\frac{a}{b}\times\frac{b}{c}=\frac{4}{7}\times\frac{5}{8}$$

$$=\frac{5}{14}$$

$$a:c=5:14$$

5. (A)

$$\text{Purchasing price}=20,000-\frac{15}{100}\times 20,000$$

$$=20,000-3000$$

$$=17000$$

6. (D)

60A18 is divisible by 3.

$\therefore$ By divisibility test of 3, the sum of all the digits of the given number should be divisible by 3 as well

$\therefore 6+0+A+1+8=15+A$

$15+A$ should be divisible by 3.

$\therefore$ 0 or 3 or 6 or 9 can be the possible value of A.

7. (B)

Numbers are

$x, x+1, x+2, x+3, x+4$

$$\text{Average}=\frac{x+x+1+x+2+x+3+x+4}{5}$$

$$=\frac{5x+10}{5}=x+2$$

8. (B)

$\sqrt{156816}=396$

To find $\sqrt{15.6816\times 10^{-2}}$

$$=\sqrt{156816\times 10^{-6}}$$

$$=\sqrt{156816}\times\sqrt{10^{-6}}$$

$$=396\times 10^{-3}$$

$$=0.396$$

9. (A)

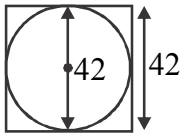
Sum of all exterior angle of any polygon is 360^{o}

10. (D)

Diameter of such a

Circle = side of the square

$= 42$



$\text{radius} = \frac{42}{2} = 21$

Area of circle $= \pi r^2$

$= \frac{22}{7} \times 21 \times 21$

$= 1386 cm^2$

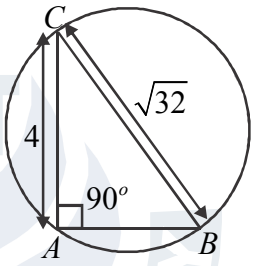
(B)

1. Sides of triangel are 4, 4, $\sqrt{32}$

Clearly as $\sqrt{4^2 + 4^2} = \sqrt{32}$

the given Δ is right angle thus $BC = \sqrt{32}$ is the

diameter of circumcircle



$\therefore r = \frac{\sqrt{32}}{\alpha} = 2\sqrt{2}$

2. $27 \div 9 \times (3-5) + 2 = -4$

3. Angles of Quadrilateral are :

$72^o, 72^o, 108^o, 108^o$

Sum of opposite angles $= 72 + 108 = 180^o$

It is a cyclic quadrilateral

4. let the distance be d

and time taken by three runners be $3x$, $5x$, and $4x$

$S_1 = \frac{d}{3x}\ S_2 = \frac{d}{5x}\ S_3 = \frac{d}{4x}$

$S_1 : S_2 : S_3 = \frac{d}{3x} : \frac{d}{5x} : \frac{d}{4x}$

$= 20 : 12 : 15$

5. Let the principal be P

Instrest $= \dfrac{prt}{100}$

$\dfrac{9}{16}.p = \dfrac{p \times r^2}{100}$ as $r = t$

$\Rightarrow r = \sqrt{\dfrac{900}{16}} = \dfrac{30}{4} = 7.5$

Q. 2

1. $6p^2 + 4p - 17 + 4p^2 - 7p + 10$

$= 10p^2 - 3p - 7$

Required expansion $= 10p^2 - p + 11 - \left(10p^2 - 3p - 7\right)$

$= 2p + 18$

2. Factorize : $27y^3 + 8x^3$

$= \left(3y\right)^3 + \left(2x\right)^3$

$= \left(3y + 2x\right)\left(9y^2 + 4x^2 - 6xy\right)$

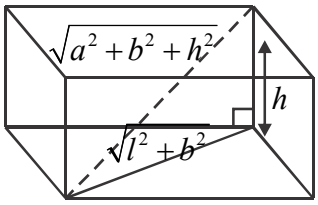
3. $x^2 - 4x + 1 = 0$

$x + \dfrac{1}{x} = 4$

$x^2 + \dfrac{1}{x^2} + 2 = 16$

$x^2 + \dfrac{1}{x^2} = 14$

4.



Diagonal of box $= \sqrt{12^2 + 9^2 + 8^2}$

$= \sqrt{144 + 81 + 64}$

$= \sqrt{289}$

$= 17$

5. $CE \perp AB$

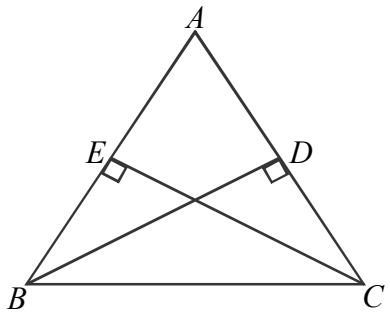
$BD \perp AC$

To prove $\Delta ABD \sim \Delta ACE$

Consider ΔABD and ΔACE

$\angle ADB = \angle AEC = 90^o$

$\angle BAD = \angle CAE$ (common angle)



Since the two angles are equal. The third angle has to be equal

$\therefore \Delta ABD \sim \Delta ACE$

Q. 3

1. Given

$a = b^{2x}$

$b = c^{2y}$

$c = a^{2z}$

Now as,

$c = 2^{2z}$

$= \left(b^{2x}\right)^{2z}$

$= b^{4xz}$

$C^1 = C^{8xyz}$

$\Rightarrow 8xyz = 1$

$\Rightarrow xyz = \frac{1}{8}$

2. Work done by B in one day $= \frac{1}{18}$

Work done by A in one day $= 2 \times \frac{1}{18}$

$= \frac{1}{9}$

Work done by A and B together in one day

$= \frac{1}{18} + \frac{1}{9} = \frac{3}{18} = \frac{1}{6}$

No. of days required by both to complete the work = 6 days

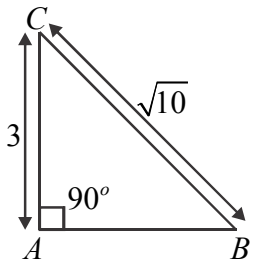
3. Let's constract a right angle triangle with base 1 unit, height 3 units

Then hypotenuse $= \sqrt{\text{base}^2 + \text{height}^2}$

$= \sqrt{1^2 + 3^2}$

$= \sqrt{1+9}$

$= \sqrt{10}$



Thus by making a line segment AB of 1 unit and another orthogonal to it with a common point 3 unit AC.

If are join BC. Then BC has to be of length $\sqrt{10}$ unit. Now measure BC with a compass and mark on number line

4. $2\pi r - 2r = 45$

$\Rightarrow 2r(\pi - 1) = 45$

$\Rightarrow 2 \times r \times \left(\frac{22}{7} - 1\right) = 45$

$\Rightarrow 2 \times r \times \frac{15}{7} = 45$

$r = \frac{21}{2} = 10.5$

5. Discount $\% = \frac{1900 - 1805}{1900} \times 100$

$= \frac{95}{19}\% = 5\%$

Q. 4

1. Let the number be x, y and z we know that
Product of two numbers = product of their G.C.D and L.C.M

$\Rightarrow \quad xy = 25 \times 150$ .....(i)

$yz = 15 \times 525$ .....(ii)

$zx = 5 \times 1050$ .....(iii)

Multiplying the three equation we get

$x^2y^2z^2 = 25 \times 150 \times 15 \times 525 \times 5 \times 1050$

$\Rightarrow xyz = 25 \times 25 \times 21 \times 3 \times 10$

Now, $z = \frac{xyz}{xy}$

$z = \frac{25 \times 25 \times 21 \times 10 \times 3}{25 \times 150}$

$= 21 \times 5 = 105$

$$y=\frac{25\times25\times21\times10\times3}{5\times1050}$$

$$=75$$

$$x=\frac{25\times25\times21\times10\times3}{5\times525}$$

$$x=50$$

$\therefore$ Three number are 50, 75, 105

2. $n(C)=58\%$

$n(F)=38\%$

$n\left[(C\cup F)^{C}\right]=17\% \quad \Rightarrow n(C\cup F)$

$=100-17$

$=83\%$

$n(C\cap F)$?

$n(C)+n(F)-n(C\cup F)=n(C\cap F)$

$\Rightarrow 58+38-83=n(C\cap F)$

$\Rightarrow 13\%=n(C\cap F)$

13% of $x=104$

$$x=\frac{104\times100}{13}=800$$

3. $2(l+b)=230\Rightarrow l+b=115$ .....(1)

$l'=l-10\%$ of l

$$=\frac{9l}{10}$$

$$b^{1}=\frac{11b}{10}$$

New perimeter $=2(l'+b')$

$$=2\left(\frac{9l}{10}+\frac{11b}{10}\right)$$

$$=\frac{9l+11b}{5}$$

$$\frac{9l+11b}{5}=224$$

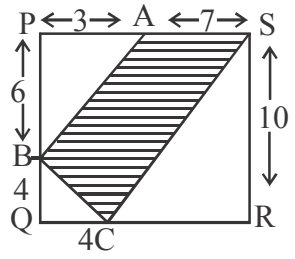
$9l+11b=1120$ .....(2)

solving (1) and (2), we have

$$l=\frac{145}{2}$$

$$b=\frac{85}{2}$$

4.



Area of shaded region = area of sq. PQRS $-\left(ar\left(\Delta PBA\right)+ar\left(\Delta BQC\right)+ar\left(\Delta SCR\right)\right)$

$$=10^2-\left(\frac{1}{2}\times6\times3+\frac{1}{2}\times4\times4+\frac{1}{2}\times10\times6\right)$$

$$=100-\left(9+8+30\right)$$

$$=53\,\text{sq.unit}$$

5. Let time taken in walking and running be t_1 and t_2 respectively

$t_1+t_2=3$

also, $t_1=\frac{d}{3},\quad t_2=\frac{15-d}{9}$

$3=t_1+t_2$

$\Rightarrow 3=\frac{d}{3}+\frac{15-d}{9}$

$\Rightarrow d=6$

Distance covered by running $=15-d$

$=15-6=9$

Q. 5

1. $\frac{9^n\times3^5\times27^3}{3\times81^4}=27,\ n=?$

$\Rightarrow\frac{3^{2n}\times3^5\times3^9}{3\times\left(3^4\right)^4}=3^3$

$\Rightarrow 3^{2n+14-17}=3^3$

$\Rightarrow 3^{2n-3}=3^3$

$\Rightarrow 2n-3=3$

$n=3$

2. Number of worker after 2 years

$$=6400\left(\frac{25}{100}\right)^2$$

$$=6400\times\frac{9}{16}$$

$$=3600$$

3.

2	281216
2	140608
2	70304
2	35152
2	17576
2	8788
2	4394
13	2197
13	169
13	13
	1

$281216 = \underline{2\times2\times2}\times\underline{2\times2\times2}\times2\times\underline{13\times13\times13}$

$\therefore$ The number should be divided by 2 to become a perfect cube.

4. $$\frac{x^6-y^6}{x^4-y^4}=\frac{\left(x^2\right)^3-\left(y^2\right)^3}{\left(x^2\right)^2-\left(y^2\right)^2}$$

$$=\frac{\left(x^2-y^2\right)\left(x^4+y^4+x^2y^2\right)}{\left(x^2-y^2\right)\left(x^2+y^2\right)}$$

$$=\frac{x^4+y^4+x^2y^2}{x^2+y^2}$$

5. Let the integer be x

$$x+\frac{x-1}{3}\le\frac{x+1}{2}$$

$$\Rightarrow\frac{12+x-1}{3}\le\frac{x+1}{2}$$

$$\Rightarrow 2x+22\le 3x+3$$

$$\Rightarrow 3x-2x\le 2z-3$$

$$\Rightarrow x\ge 19$$

Least value of such integer is 19