HHC
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Maths

Holiday Homework

1. Sum of the two integers = 28.
One of the integer = -45
So, the other = 28 - (-45).
= 73.

2. Since a number changes from -20 to 30,
So, the increase in the number will be;
⇒ 30 - (-20) = 50.
So, the increase in the number is 50.

3. = 23 × (103 + (-3))
⇒ 23 × 100 = 2300.

4. i) $\frac{3}{5} = \frac{6}{10}; \frac{9}{15}; \frac{12}{20}$

ii) $\frac{4}{-7} = \frac{8}{-14}; \frac{12}{-21}; \frac{16}{-28}$.

iii) $\frac{-5}{9} = \frac{-10}{18}; \frac{-15}{27}; \frac{-20}{36}$.

iv) $\frac{8}{-15} = \frac{16}{-30}; \frac{24}{-45}; \frac{32}{-60}$.

5. $\frac{8}{0}$ and $\frac{0}{0}$ are not rational numbers:

6. $\frac{5}{-15} < \frac{-11}{-30} < \frac{7}{10}$

7. $\frac{-9}{25} + \frac{-1}{75}$.

⇒ lcm of 25 and 75 is 75.

$\frac{-9 \times 3}{25 \times 3} = \frac{-27}{75}$.

⇒ $\frac{-27 - 1}{75} = \frac{-28}{75}$.

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$\frac{-9}{16} + \frac{-11}{8}$.

$\Rightarrow$ lcm of 8 & 16 is 16.

$\frac{-11 \times 2}{8 \times 2} = \frac{-22}{16}$.

$\Rightarrow \frac{9}{16} + \frac{-22}{16} = \frac{-13}{16}$.

8. Sum of two rational number = $\frac{-7}{12}$.
One of them = $\frac{13}{24}$.

The other rational number = $\frac{-7}{12} - \frac{13}{24}$.

$\Rightarrow \frac{-7 \times 2}{12 \times 2} = \frac{-14}{24}$.

$\Rightarrow \frac{-14}{24} - \frac{13}{24} = \frac{-27}{24}$.

$\Rightarrow \frac{-9}{8}$.

9. $\frac{-4}{5} \times \frac{5}{2} = \frac{-6}{5}$

$\Rightarrow \frac{9}{-5} \times \frac{10}{3} = \frac{-6}{1}$.

$\Rightarrow \frac{-6}{5} + \frac{-6}{1}$ (lcm of 5 & 1 is 5).

$\Rightarrow \frac{-6}{5}, \frac{-6 \times 5}{1 \times 5} = \frac{-30}{5}$

$\Rightarrow \frac{-6}{5} + \frac{-30}{5} = \frac{-36}{5}$

$\frac{-3}{2} \times \frac{-1}{4} = \frac{3}{8}$.

$\Rightarrow \frac{-36}{5} - \frac{3}{8}$ (lcm of 5 & 8 is 40).

⇒ $\frac{-36\times 8}{5\times 8} = \frac{-288}{40}$; $\frac{3\times 5}{8\times 5} = \frac{15}{40}$.

⇒ $\frac{-288-15}{40} = \frac{-303}{40}$.

ii) $\frac{-35}{39}\times\frac{-18}{7} = \frac{-5}{-3} = \frac{5}{3}$.

⇒ $\frac{7}{90}\times\frac{-18}{14} = \frac{1}{-10} = \frac{-1}{10}$.

⇒ $\frac{5}{3} - \frac{-1}{10}$ (lcm of 3 & 10 is 30).

⇒ $\frac{5\times 10}{3\times 10} = \frac{50}{30}$; $\frac{-1\times 3}{10\times 3} = \frac{-3}{30}$.

⇒ $\frac{50-(-3)}{30} = \frac{53}{30} = 1\frac{23}{30}$.

10. $\frac{9}{17}+\frac{6}{13} = \frac{15}{30} = \frac{1}{2}$.

11. Distance covered in 1 litre petrol.
= $31\frac{1}{4}$ km = $\frac{125}{4}$ km.

∴ Distance covered in $1\frac{3}{5}$ litre of petrol.

⇒ $\frac{125}{4}\times\frac{8}{5} = 50$ km.

12. i) $\frac{303}{25} = 12.12$.

ii) $\frac{2.1\times 100}{0.01\times 100} = \frac{210}{1} = 210$.

13. i) $1.\overline{28} = 1+0.\overline{28}$

⇒ $1 + \frac{28-0}{99}$

⇒ $1+\frac{28}{99}$

⇒ $1\frac{28}{99}$

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ii) $5.\overline{284} = 5 + 0.\overline{284}$

$\Rightarrow 5 + \frac{284-0}{999}$

$\Rightarrow 5\frac{284}{999}$.

14. i) $4.2 \times 0.6 = 2.52$.

So, there are 3 significant digits.

ii) $0.08 \times 25 = 2$.

Therefore there is only 1 significant digit.

iii) $3.6 \div 0.12 = 30$.

So, there are 2 significant digits.

15. i) $\frac{5^4}{5^3} \times 5^5 = 5^{4-3+5} = 5^6$

$\Rightarrow 15625$

ii) $\frac{4^4}{4^3 . 4^0} = \frac{4^4}{4^3 \times 1}$

$= \frac{4^4}{4^3} = 4^{4-3} = 4^1$

$\Rightarrow 4$.

iii) $3^{5\times0} \times 4^{7\times0} \times 5^{8\times0}$.

$\Rightarrow 3^0 . 4^0 . 5^0 = 1 \times 1 \times 1 = 1$.

16) $\Rightarrow a^{-7-3} \times b^{-7+5} \times c^{5-(-3)} \times d^{4-8}$

$\Rightarrow a^{-10} \times b^{-2} \times c^8 \times d^{-4}$.

$\Rightarrow \frac{c^8}{a^{10} b^2 d^4}$

17. i) Monomial

ii) Binomial.

iii) Monomial.

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18. i) . -1.
ii) . rp^2

19. i) . degree of $3y^3 = 3$.
degree of $x^2y^2 = 4$. (highest degree).
degree of $4x = 1$.

So, the degree of the polynomial is 4.

ii) degree of $p^3q^2 = 5$.
degree of $6p^2q^5 = 7$
degree of $p^4q^4 = 8$. (highest degree).

So, the degree of the polynomial is 8.

20. $\Rightarrow 4a^3 + 2x^3 + 5a^3 + 2x^2 - 5x^2 + x^2 - x - 3x - 7x + 1 + 6 + 8$.
$\Rightarrow 11a^3 + 3x^2 - 5x^2 - 11x + 15$
$\Rightarrow 11x^3 - 2x^2 - 11x + 15$.

21. $\Rightarrow (3m^3 + 4) - (6m^3 + 4m^2 + 7m - 3)$.
$\Rightarrow 3m^3 + 4 - 6m^3 - 4m^2 - 7m + 3$.
$\Rightarrow 3m^3 - 6m^3 - 4m^2 - 7m + 4 + 3$.
$\Rightarrow -3m^3 - 4m^2 - 7m + 7$.

22. i) $c^2 - 3c + 5c - 15$
$\Rightarrow c^2 + 2c - 15$

ii) $\Rightarrow 3c(4c - 6d) - 5d(4c - 6d)$.
$\Rightarrow 12c^2 - 18cd - 20cd + 30d^2$.
$\Rightarrow 12c^2 - 38cd + 30d^2$.

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23. $9x^2 - 24xy + 16y^2$ by $3x - 4y$.

Ans. $3x-4y \overline{)9x^2-24xy+16y^2} (3x-4y$

$9x^2 - 12xy$

$-$ (+)

$-12xy + 16y^2$

$-12xy + 16y^2$

0

$15x^2 + 31xy + 14y^2$ by $5x + 7y$.

Ans. $5x+7y \overline{)15x^2+31xy+14y^2} (3x+2y$

$15x^2 + 21xy$

(-)

$10xy + 14y^2$

$10xy + 14y^2$

0

24. $\Rightarrow \frac{4y + 2y = 7 - y}{4}$.

$\Rightarrow 4y + 2y = 7 - y$.

$\Rightarrow 4y + 2y = 7y = 7$.

$\Rightarrow y = \frac{7}{7} = 1$

$\Rightarrow y = 1$.

25. Let the 1st number $= x$

2nd no. $= y$.

$\Rightarrow x + y = 18$ and $x = 2y$.

$\Rightarrow 2y + y = 18$.

$\Rightarrow x = 2y = 18$.

$\Rightarrow 3y = 18$.

$\Rightarrow y = \frac{18}{3} = 6$.

$\Rightarrow x = 2 \times 6 = 12$.

So, the two numbers are 12, 6.

26. i). $\{x : x$ is a natural number divisible by 3; $x < 18\}$

ii). $\{x : x$ is a prime number$\}$.

iii). $\{x : x$ is perfect square natural number; $x < 36\}$.

iv). $\{x : x$ is a odd number divisible by 2$\}$.

v). $\{x : x$ is one of the first three days of the week$\}$.

vi). $\{x : x$ is an odd natural number; $x \geq 25\}$.

27. i). $n(A) = 5$.

28. i) Null set ϕ
ii) Infinite set
iii) Finite.
iv). Null set ϕ

29. i). 6.
ii). 5.
iii). $\{8, 16\}$ and 2.

30. i). Yes, as $\angle AOB$ and $\angle AOC$ are on opposite sides of the common arm OA.

ii). No, as $\angle AOB$ and $\angle AOC$ are not on opposite sides of the common arm OB.

31. $\because$ AOC is a straight line.
$\therefore \angle AOB + \angle BOD + \angle DOC = 180°$.
$\Rightarrow y + 150° + x + x = 180°$.
$\Rightarrow y + 150° = 180°$

$\Rightarrow y = 180^\circ - 150^\circ = 30^\circ.$
$\Rightarrow y = 30^\circ.$

32. i). $\Rightarrow a = b$ (corresponding angles).
$\Rightarrow b = c$ (vertically opposite angles).
$\Rightarrow a = c$ (alternate angles).
$\therefore a = b = c.$

ii). $\Rightarrow x = y$ (vertically opposite angles).
$\Rightarrow y = l$ (alternate angles).
$\Rightarrow x = l$ (corresponding angles).
$\Rightarrow l = n$ (vertically opposite angles).
$\Rightarrow n = m$ (corresponding angles).
$\Rightarrow \therefore x = y = n = m.$

Again $m = k$ (vertically opposite angles).
$k = q$ (corresponding angles).
$\therefore m = k = q.$

33. $\Rightarrow \angle a = 60^\circ + 50^\circ = 110^\circ.$
$\Rightarrow \angle c = 100^\circ - 55^\circ = 45^\circ.$
$\angle c = 45^\circ.$
$\Rightarrow \angle b = 108^\circ - 48^\circ.$
$\angle b = 60^\circ.$

34. $\Rightarrow 61^\circ + \angle B + \angle C = 180^\circ$ (angles of a triangle).
$\Rightarrow \angle B + \angle C = 1\frac{1}{2} : 1\frac{1}{5} = \frac{3}{2} : \frac{6}{5}.$
$\Rightarrow \frac{9:8}{6} = 9:8.$

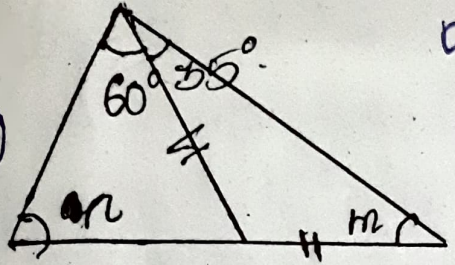
Let $\angle B = 9x$ and $\angle C = 8x.$
$\Rightarrow 9x + 8x = 17x.$
$\Rightarrow 17x = 119^\circ \Rightarrow x = \frac{119^\circ}{17} = 7^\circ.$
$\therefore \angle B = 9x = 9 \times 7^\circ = 63^\circ.$
$\therefore \angle C = 8x = 8 \times 7^\circ = 56^\circ.$

85. i). $\Rightarrow 110^\circ = x^\circ + 30^\circ$.
$\Rightarrow x^\circ = 110^\circ - 30^\circ = 80^\circ$.

ii). $120^\circ = y^\circ + 60^\circ$.
$\Rightarrow y^\circ = 120^\circ - 60^\circ = 60^\circ$.

iii). $122^\circ = k^\circ + 35^\circ$.
$\Rightarrow k^\circ = 122^\circ - 35^\circ = 87^\circ$.

iv). $135^\circ = a^\circ + 73^\circ$.
$\Rightarrow a^\circ = 135^\circ - 73^\circ = 62^\circ$



16) Ans. $m = 65°$ (Angles opposite to equal sides).

But $m + n + (60° + 65°) = 180°$ (Angles of a triangle).

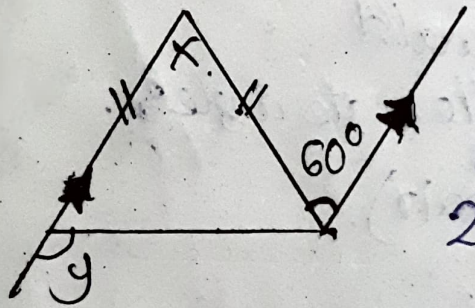
$\Rightarrow m + n + 95° = 180°$.

$\Rightarrow 65° + n + 95° = 180°$.

$\Rightarrow n + 180° = 180°$

$\Rightarrow n = 180° - 180° = 50°$.

Hence $m = 65°$, $n = 50°$.



Ans. $x = 60°$ (Alternate angles).

Let each equal angle of an isosceles triangle be a then $a + a + x = 180°$ (Angles of a triangle)

$2a + x = 180° \Rightarrow 2a + 60° = 180°$.

$\Rightarrow 2a = 180° - 60° = 120°$.

$\Rightarrow a = \frac{120°}{2} = 60°$.

$\therefore y = x + a = 60° + 60° = 120°$

Hence $x = 60°$ and $y = 120°$.