Solutions for Test Paper 04

1. $$\frac{1}{x} + \frac{2}{x} = 3$$

   Combine the fractions:

   $$\frac{3}{x} = 3$$

   Solve for x:

   $$x = 1$$

   $$\boxed{A}$$

2. Let the speed of the boat in still water be b km/h. The speed downstream is $b + 2$ km/h, and the speed upstream is $b - 2$ km/h. Let the distance be d km. According to the question:

   $$d = 4(b + 2) \quad \text{and} \quad d = 5(b - 2)$$

   Equate the two expressions for d:

   $$4(b + 2) = 5(b - 2)$$

   Expand and solve for b:

   $$4b + 8 = 5b - 10 \implies 8 + 10 = 5b - 4b \implies b = 18$$

   $$\boxed{B}$$

3. $$5t - 3 = 3t - 5$$

   Subtract $3t$ from both sides:

   $$2t - 3 = -5$$

   Add 3 to both sides:

   $$2t = -2 \implies t = -1$$

   $$\boxed{C}$$

4. The sum of the angles of a triangle is 180°:

   $$(x + 10) + (2x - 30) + x = 180$$

   Simplify:

   $$4x - 20 = 180 \implies 4x = 200 \implies x = 50$$

   $$\boxed{C}$$

5.

$$7(y+3)-2(y-5)=5(y+6)$$

Expand and simplify:

$$7y+21-2y+10=5y+30 \implies 5y+31=5y+30$$

Subtract $5y$ from both sides:

$$31=30$$

This is a contradiction, so there are no solutions.

$$\boxed{A}$$

6. Let the number be n. According to the question:

$$n+\frac{2}{3}n=35$$

Combine like terms:

$$\frac{5}{3}n=35 \implies n=35\times\frac{3}{5} \implies n=21$$

$$\boxed{B}$$

7.

$$x-\frac{x-1}{2}=1-\frac{x-2}{3}$$

Multiply through by 6 to eliminate denominators:

$$6x-3(x-1)=6-2(x-2)$$

Expand and simplify:

$$6x-3x+3=6-2x+4 \implies 3x+3=10-2x$$

Solve for x:

$$5x=7 \implies x=\frac{7}{5}$$

$$\boxed{C}$$

8. Let the length be L meters. Then, the width is $\frac{3}{4}L$ meters. The perimeter is:

$$2\left(L+\frac{3}{4}L\right)=70 \implies 2\left(\frac{7}{4}L\right)=70 \implies \frac{7}{2}L=70 \implies L=20$$

$$\boxed{B}$$

9.

$$5y-2=18 \implies 5y=20 \implies y=4$$

$$\boxed{D}$$

10. Let the three consecutive integers be $n-1$, n, and $n+1$. According to the question:

$$(n-1)+n+(n+1)=51 \implies 3n=51 \implies n=17$$

The middle integer is:

$$\boxed{C}$$

11.

$$0.25(4z-3)=0.05(10z-9)$$

Multiply both sides by 100 to eliminate decimals:

$$25(4z-3)=5(10z-9)$$

Expand and simplify:

$$100z-75=50z-45 \implies 50z=30 \implies z=\frac{30}{50} \implies z=\frac{3}{5}$$

$$\boxed{C}$$

12.

$$2x+1<5 \implies 2x<4 \implies x<2$$

The natural numbers less than 2 are:

$$\{1\}$$

$$\boxed{A}$$

13. The equation is:

$$\frac{z}{3}+7=12$$

$$\boxed{B}$$

14.

$$\frac{3n+2}{n-1}=\frac{3}{2}$$

Cross-multiply:

$$2(3n+2)=3(n-1)$$

Expand and simplify:

$$6n+4=3n-3 \implies 3n=-7 \implies n=-\frac{7}{3}$$

$$\boxed{C}$$

15. Let the digit at the units place be u. Then, the digit at the tens place is $2u$. According to the question:

$$u+2u=9 \implies 3u=9 \implies u=3$$

The digit at the tens place is:

$$2u=6$$

The number is:

$$63$$

$$\boxed{B}$$