

RI Term 1 Exam 2024 Answers

1) (i) $5\pi, \frac{\sqrt{11}}{5}$

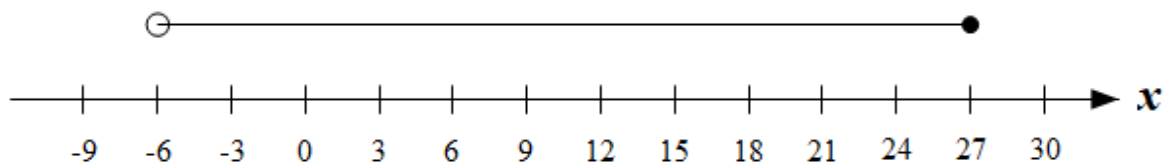
Cannot be expressed as a ratio of integers

(ii) $46, (-7)^2$

46 and 49 have more than 2 factors

2) $0.2463 \approx 0.25$ (2d.p.)

3) Solid circle when including equal to, hollow circle when not including equal to



4)
$$-\left(-\frac{1}{2}\right)^3 + \sqrt{5\frac{4}{9}} \div \left(-\frac{1}{4} + \frac{1}{5} \div \frac{4}{33}\right) = -\left(-\frac{1}{8}\right) + \sqrt{\frac{49}{9}} \div \left(-\frac{1}{4} + \frac{1}{5} \times \frac{33}{4}\right) = \frac{1}{8} + \frac{7}{3} \div \left(-\frac{1}{4} + \frac{33}{20}\right)$$

$$= \frac{1}{8} + \frac{7}{3} \div \left(-\frac{5}{20} + \frac{33}{20}\right) = \frac{1}{8} + \frac{7}{3} \div \frac{28}{20} = \frac{1}{8} + \frac{7}{3} \times \frac{5}{7} = \frac{1}{8} + \frac{5}{3} = \frac{43}{24}$$

5) Substitute $a = 3, b = -2, c = 5, d = -7$ into the equation,

$$\frac{3(a+b)^2 - 2(d+2c)^3}{5\sqrt[3]{d^2 - b^2c - 2}} = \frac{3((3) + (-2))^2 - 2((-7) + 2(5))^3}{5\sqrt[3]{(-7)^2 - (-2)^2(5) - 2}}$$

$$= \frac{3(1)^2 - 2(3)^3}{5\sqrt[3]{49 - 20 - 2}} = \frac{3 - 54}{5\sqrt[3]{27}} = -\frac{51}{15} = -\frac{17}{5}$$

6) (i) $\$(512y - 562x)$

$$3(52y - 62x) + 148(5y - 6x) + 128(4x - 3y)$$

$$= 156y - 186x + 740y - 888x + 512x - 384y$$

$$= 512y - 562x$$

(ii) \$2210

Sub $x = 7, y = 12$ to find the total cost,

Total cost = $512(12) - 562(7) = 2210$

7) 14.16

$$\sqrt[3]{2841} = \sqrt[3]{2.841 \times 1000} = \sqrt[3]{2.841} \times 10 = 1.416 \times 10 = 14.16$$

$$8) \text{ (i) } 3960 = 2^3 \times 3^2 \times 5 \times 11$$

$$\text{(ii) } x = 2^3 \times 11 = 88$$

$$\text{(iii) } p = p = 2 \times 5 \times 11 = 110$$

$$9) \text{ HCF} = 2^2 \times 5 = 20$$

$$240 = 2^4 \times 3 \times 5$$

$$260 = 2^2 \times 5 \times 13$$

$$300 = 2^2 \times 3 \times 5^2$$

$$10) 7704252$$

$12 = 3 \times 4$ For a number to be divisible by 4, the last 2 digits must be divisible by 4. The smallest last two digits that fulfils this condition is 52. For a number to be divisible by 3, the sum of all digits must be divisible by 3. The sum of all the digits currently present is $7 + 7 + 4 + 5 + 2 = 25$, so the smallest number is 7704252.

$$11) \text{ (i) } 8x^3 + 4x^2 - 6x + 2$$

$$12x^3 + 4x^2 + 2x - 6 - 2(2x^3 + 4x - 4)$$

$$= 12x^3 + 4x^2 + 2x - 6 - (4x^3 + 8x - 8)$$

$$= 8x^3 + 4x^2 - 6x + 2$$

$$\text{(ii) } 236\text{m}^2$$

If $x = 3$,

$$\text{Area} = 8(3)^3 + 4(3)^2 - 6(3) + 2 = 216 + 36 - 18 + 2 = 236$$