

Solution Test 4

1. The probability of selecting a red ball is $\frac{1}{3}$ and the probability of selecting a white ball is $\frac{1}{3}$, so the probability of selecting a red and a white ball is $\frac{1}{3} + \frac{1}{3} = \frac{2}{3}$
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2.

r: radius of the circle

a: length of the square

$$4a = 16 \rightarrow a = 4$$

$$\frac{r}{a} = \frac{1}{2} \rightarrow \frac{r}{4} = \frac{1}{2} \rightarrow r = 2$$

$$4\pi r = 4\pi \times 2 = 8\pi$$

3.

$$|n - 3| = 3 \rightarrow n - 3 = \pm 3 \rightarrow n = 6, n = 0$$

$$|2m + 12| = n \rightarrow \begin{cases} |2m + 12| = 0 \rightarrow 2m + 12 = 0 \rightarrow m = -6 \\ |2m + 12| = 6 \rightarrow 2m + 12 = \pm 6 \rightarrow m = -9, m = -3 \end{cases}$$

4.

$$x = \frac{x-2}{2-x} \rightarrow 2x - x^2 = x + 1 \rightarrow x^2 - x - 2 = 0 \rightarrow x = -1, x = 2$$

5.

$$ab = 4 \xrightarrow{b=-4} a \times (-4) = 4 \rightarrow a = -1$$

$$\frac{a}{b} = \frac{-1}{-4} = \frac{1}{4}$$

6.

$$\text{if } l_1 \perp l_2 \quad \text{then} \quad m_1 \times m_2 = -1$$

7.

$$\frac{a+b}{2} = \frac{b+c}{2} \rightarrow a + b = b + c \rightarrow a = c \rightarrow a - c = 0$$

8.

$x = X$'s age

$y = Y$'s age

$$\begin{cases} x = y + 8 \\ x + y = 30 \end{cases} \rightarrow \begin{cases} x - y = 8 \\ x + y = 30 \end{cases} \rightarrow 2x = 38 \rightarrow x = 19, y = 11 \rightarrow x \times y = 209$$

9.

$$1 + 2 + 4 + 8 + \dots + 128 = 1 + 2 + 2^2 + 2^3 + \dots + 2^7 = \frac{1 - 2^8}{1 - 2} = 2^8 - 1$$

10.

$$b < 0 < a \rightarrow \frac{1}{b} < 0, 0 < \frac{1}{a} \rightarrow \frac{1}{b} < 0 < \frac{1}{a}$$

$$\begin{cases} b < 0 \rightarrow 0 < -b \\ 0 < a \rightarrow -a < 0 \end{cases} \rightarrow -a < 0 < -b$$

11.

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

12.

$$k \geq 3 \text{ and prime} \rightarrow k \text{ is odd} \xrightarrow{m \text{ is even}} km \text{ is even} \rightarrow km + 1 \text{ is odd}$$

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13.

$$f(0) = 0 \text{ and } f(1) = 2 \text{ so } f(0) + f(1) = 2$$

14.

$$\begin{cases} x + y + z = 4 \\ -y - z = 6 \end{cases} \rightarrow x = 4 + 6 = 10$$

15.

$$\frac{50}{100} \times \frac{50}{100} \times x = \frac{30}{100} \times \frac{30}{100} \times 900 \rightarrow x = 324$$

16.

$$30 + 90 + \angle C = 180 \rightarrow \angle C = 60 \rightarrow \widehat{AD} = 120$$

17.

$$f(x) = x^2 - x + \sqrt{2} \rightarrow f(\sqrt{2}) = (\sqrt{2})^2 - \sqrt{2} + \sqrt{2} = 2$$

18.

$$ab = c \rightarrow b = \frac{c}{a} \xrightarrow{\frac{a}{b}=d} \frac{a^2}{c} = d \rightarrow a^2 = cd \rightarrow a = \sqrt{cd}$$

19.

$$f(x) = 3x^2 + 2x + 5 \rightarrow f(0) = 5$$

$$g(x) = x^3 - x^2 + x - 4 \rightarrow g(1) = -3$$

$$f(0) - g(1) = 5 - (-3) = 5 + 3 = 8$$

20.

$$\frac{a+b}{2} = c = \frac{b-d}{2} \rightarrow \frac{a+b}{2} = \frac{b-d}{2} \rightarrow a+b = b-d \rightarrow a = -d \rightarrow a+d = 0 \rightarrow \frac{a+d}{2} = 0$$