

**KUNCI UN MATEMATIKA SMA IPA
PAKET 1**

1. **Jawaban: A**

Pembahasan:

premis 1: $p \rightarrow q$

premis 2: p

menurut modus ponens, kesimpulannya: q atau: "Semua karyawan sedih".

2. **Jawaban: A**

Pembahasan:

$$\frac{(a^2b^{-2})^5}{((2a)^3b^2)^{-2}} = \frac{a^{10}b^{-10}}{2^{-6}a^{-6}b^{-4}} = \frac{2^6a^{16}}{b^6}$$
$$= \frac{64a^{16}}{b^6}$$

3. **Jawaban: A**

Pembahasan:

$$x = 2 + \sqrt{3}, y = 3 - \sqrt{2}$$

$$x^2 + y^2 - 2xy = (2 + \sqrt{3})^2 + (3 - \sqrt{2})^2 - 2(2 + \sqrt{3})(3 - \sqrt{2})$$
$$= 7 + 4\sqrt{3} + 11 - 6\sqrt{2} - 12 + 4\sqrt{2} - 6\sqrt{3} + 2\sqrt{6}$$
$$= 6 - 2\sqrt{3} - 2\sqrt{2} + 2\sqrt{6}$$

4. **Jawaban: C**

Pembahasan:

$${}^3\log(3x-1) \times {}^5\log 3 = 3$$

$$\frac{{}^3\log(3x-1)}{{}^3\log 5} = 3$$

$${}^5\log(3x-1) = 3$$

$$5^3 = 3x - 1$$

$$125 = 3x - 1$$

$$126 = 3x \rightarrow x = \frac{126}{3} = 42$$

5. **Jawaban: E**

Pembahasan:

$$y = px^2 + (p-1)x + 1$$

$$x = 3 \rightarrow -\frac{b}{2a} = 3$$

$$-\frac{(p-1)}{2p} = 3$$

$$-p+1=6p$$

$$-7p=-1 \rightarrow p = \frac{1}{7}$$

6. **Jawaban: A**

Pembahasan:

$$x^2 + (a - 1)x - a + 4 = 0$$

Syarat agar dua akar nyata berbeda :

$$D > 0$$

$$b^2 - 4ac > 0$$

$$(a - 1)^2 - 4(1)(-a + 4) > 0$$

$$(a - 1)^2 + 4(a - 4) > 0$$

$$a^2 - 2a + 1 + 4a - 16 > 0$$

$$a^2 + 2a - 15 > 0$$

$$(a + 5)(a - 3) > 0$$

Jadi, $a < -5$ atau $a > 3$

7. **Jawaban: B**
Pembahasan:

$$\left(x - \frac{1}{3}\right)(x - 4) = 0$$

$$\Leftrightarrow x^2 - 4x - \frac{1}{3}x + \frac{4}{3} = 0$$

$$\Leftrightarrow x^2 - 4\frac{1}{3}x + \frac{4}{3} = 0$$

$$\Leftrightarrow x^2 - \frac{13}{3}x + \frac{4}{3} = 0$$

$$\Leftrightarrow 3x^2 - 13x + 4 = 0$$

8. **Jawaban: D**
Pembahasan:

Persamaan garis singgung:

$$x_1x + y_1y = 9$$

$$\Leftrightarrow -4x + 3y = 9$$

9. **Jawaban: D**
Pembahasan:

$$(g \circ f)(x) = 4x^2 - 2x$$

$$g(2x - 1) = 4x^2 - 2x$$

Misalkan $y = 2x - 1$, maka $x = \frac{y+1}{2}$

$$g(y) = 4\left(\frac{y+1}{2}\right)^2 - 2\left(\frac{y+1}{2}\right)$$

$$= y^2 + 2y + 1 - y - 1$$

10. **Jawaban: D**
Pembahasan:

$$f(x) = 2x - 6, \text{ misalkan } f(x) = y$$

$$2x = 2x - 6$$

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

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

$$f^{-1}(12) = \frac{1}{2}(12) + 3 = 9$$