1. $\frac{3\sqrt{3}}{25}$

2. $\frac{x^2+5x+25}{x+5}$

3. $x-\sqrt{3}\,y-2\sqrt{3}+15=0$

4. $-5\le y\le 3$ (or interval notation: $[-5,3]$

5. 64sqrt(6)

6. ~~$\frac{4\sqrt{3}}{3}$~~ 4

7. $-3 \le x < 0$ or $x > 6$ (in interval notation: $[-3,0)\cup(6,\infty)$)

8. 3b – a – 1

9. 7500

10. 4.25

11. $\frac{24}{5}+\frac{-8}{5}i=4.8-1.6i$

12. 200

13. 54432 $x^{12}b^{24}$

14. $3\sqrt{3}$

15. Area changed by 4%

Question 1

$r = \frac{25}{2}$, $a = \frac{\sqrt{3}}{4}\left(\frac{25\pi}{3}\right)^2$, $d = \frac{25\pi\sqrt{2}}{4}$ $\qquad \frac{d^2}{ar} = \frac{\left(25\pi\sqrt{2}\right)^2}{16} \bullet \frac{36}{\sqrt{3}\left(25\pi\right)^2} \bullet \frac{2}{25} = \frac{3\sqrt{3}}{25}$

Question 2

$S = \frac{(x-5)\left(x^2+5x+25\right)}{x+5}$, $C = \frac{(x-1)(x+5)}{(x+1)(x-1)^2\left(x^2+x+1\right)}$, $U = \frac{\left(x^2+x+1\right)\left(x^2-1\right)}{(x+5)(x-5)}$

$CSU = \frac{x^2+5x+25}{x+5}$

Question 3

Incline $30^\circ \rightarrow m = \frac{1}{\sqrt{3}}$; $y_2 = \sqrt{3}(x+5) - 2 \rightarrow y - \text{intercept} = -2+5\sqrt{3}$ Our line: $x - \sqrt{3}\,y - 2\sqrt{3} + 15 = 0$

Question 4

Range of g(x): $y \geq -5$, Range of f(x): $y \leq 3$ $\qquad$ Range of $(f \cap g)(x)$: $-5 \leq y \leq 3$

Question 5

Radius inscribed circle = (Area Δ)/(semi-perimeter Δ) Area Δ = $rs = \left(2\sqrt{6}\right)(32) = 64\sqrt{6}$

Question 6

$A = i^{-8}$, $i^{-8} = \frac{1}{i^8} = \frac{1}{i^4 \times i^4} = \frac{1}{1\times 1} = 1$

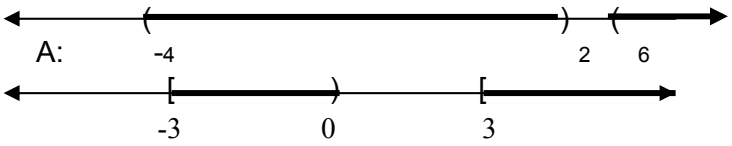
$B =$ The product of the roots of the polynomial $ax^2 + bx + c$ is c/a. In this case the product of the roots is

$C = \log_B 5 + \log_B \frac{81}{5} = \log_3 5 + \log_3 \frac{81}{5} = \log_3\left(5 \times \frac{81}{5}\right) = \log_3 81 = 4$.

$D = \frac{B}{1-\frac{A}{C}} = \frac{3}{1-\frac{1}{4}} = \frac{3}{3/4} = 4$ **Answer = 4**

Question 7

B:



Intersection $-3 \leq x < 0$ or $x > 6$

Question 8

c = (2 log 3 + log 7 – 2) + (log 3 + 1 – 2 log 7) = 3log 3 – log 7 – 1 = 3b – a – 1

Question 9

$$m = \frac{kd}{e^2} \text{ or } \frac{m_1 e_1^2}{d_1} = \frac{m_2 e_2^2}{d_2} \rightarrow \frac{25(20^2)}{10} = \frac{m_2(2^2)}{30} \rightarrow \text{moose} = 7500$$

Question 10

(A) P(EandC) = P(E) + P(C) – P(E or C)
= 0.4 + 0.7 – 0.85
= 0.25

(B) $(0.4)(0.7) \neq 0.25$ neither M.E. or Independent = 4

a + b = 4.25

Question 11

$$B = 0 \rightarrow \frac{A+B}{CD} = \frac{16+0}{\left(\frac{1-3i}{5}\right)(5i)} = \frac{24}{5} + \frac{-8}{5}i = 4.8 - 1.6i$$

Question 12

5x + 2y = 120
3x – 2y = 40 x = 20, y = 10 xy = 200

Question 13

G = Middle term of $(2x^2 - 3b^4)^{12} \equiv \binom{12}{6}(2x^2)^6(-3b^4)^6 = 43{,}110{,}144x^{12}b^{24}$

$H = \binom{12}{7} = 792$ G/H = 54432 $x^{12}b^{24}$

Question 14

$$\frac{\sqrt{6}}{2} \cdot \frac{3\sqrt{2}}{1} = \frac{6\sqrt{3}}{2} = 3\sqrt{3}$$

Question 15

Area of rectangle = LW
Area of new rectangle = (1.2L)(.8W) = .96LW. Area decreased 4%