

MAC 1105 PRAC. EXAM II KEY

$$\begin{aligned} \textcircled{1} \quad & x^{1/3} y^{1/3} x^{2/5} y^{3/5} \\ & = x^{1/3} x^{2/5} y^{1/3} y^{3/5} \\ & = x^{11/15} y^{14/15} \quad (\text{adding exponents}) \end{aligned}$$

$$\textcircled{2} \quad \frac{(49-x^2)^{1/2} + 3x^2}{(49-x^2)^{1/2} (49-x^2)}$$

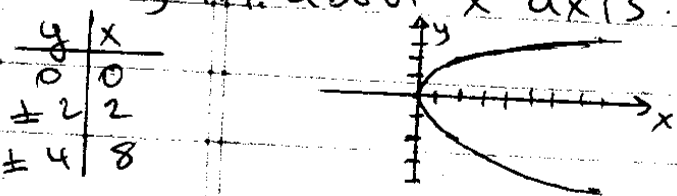
Multiply each part by $(49-x^2)^{1/2}$.
Get $\frac{49-x^2 + 3x^2}{(49-x^2)^{3/2}} = \frac{49+2x^2}{(49-x^2)^{3/2}}$

$$\textcircled{3} \quad \frac{1}{\left(\frac{16}{81}\right)^{1/2}} = \frac{1}{\left(\frac{4}{9}\right)^3} = \frac{9^3}{4^3} = \frac{729}{64}$$

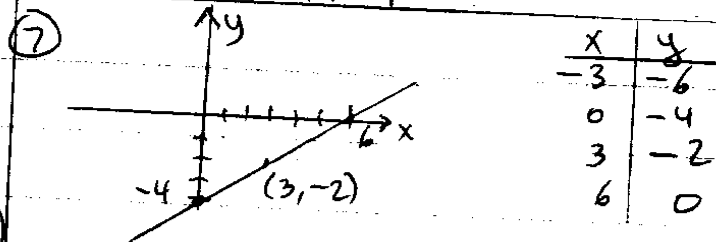
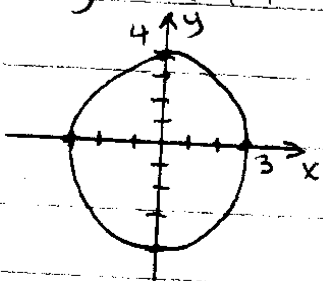
$$\textcircled{4} \quad d = \sqrt{(3-4)^2 + (-2-9)^2} = \sqrt{1^2 + 11^2} = \sqrt{122} \approx 11.05$$

$$\textcircled{5} \quad \frac{1}{2}(-y)^2 = \frac{1}{2}y^2 = x$$

Symm. about x axis.



$$\begin{aligned} \textcircled{6} \quad & y=0 \Rightarrow 16x^2 = 144 \Rightarrow x = \pm 3 \\ & x=0 \Rightarrow 9y^2 = 144 \Rightarrow y = \pm 4 \end{aligned}$$



$$\textcircled{8} \quad x = -3$$

$$\begin{aligned} \textcircled{9} \quad & (t, V) \quad (0, 10000) \quad (10, 1000) \\ & m = \frac{1000 - 10000}{10} = -900 \\ & V = -900t + 10,000 \end{aligned}$$

$$\begin{aligned} \textcircled{10} \quad & m_{\perp} = -\frac{1}{3} \\ & y - 3 = -\frac{1}{3}(x+1) \\ & y - 3 = -\frac{1}{3}x - \frac{1}{3} \\ & y = -\frac{1}{3}x + \frac{14}{3} \end{aligned}$$

$$\begin{aligned} \textcircled{11} \quad & x^2 - 6x + 9 + y^2 + 8y + 16 = -16 + 9 + 16 \\ & (x-3)^2 + (y+4)^2 = 9 \\ & \text{Center} = (3, -4) \quad r = 3 \end{aligned}$$

$$\begin{aligned} \textcircled{12} \quad & (x+1)^2 + 2(x+1) - 5 \\ & = x^2 + 2x + 1 + 2x + 2 - 5 \\ & = x^2 + 4x - 2 \end{aligned}$$

$$\begin{aligned} \textcircled{13} \quad & 3x + 2 \geq 0 \\ & 3x \geq -2 \\ & x \geq -\frac{2}{3} \end{aligned}$$

$$\begin{aligned} \textcircled{14} \quad & (f-g)(x) = f(x) - g(x) \\ & = \frac{1}{x-3} - \sqrt{x} \end{aligned}$$

domain: $x \geq 0, x \neq 3.$

MAC 1105 PRACTICE EXAM II (70 pts.)

① Simplify: (without radicals)
 $(xy)^{1/3} (x^2 y^3)^{1/5}$

② Simplify by writing the expression as a single quotient with only positive exponents:

$$\frac{(49 - x^2)^{1/2} + 3x^2(49 - x^2)^{-1/2}}{49 - x^2}$$

Do not leave a compound fraction.

③ Find the value of $\left(\frac{16}{81}\right)^{-3/2}$ without a calculator. Show all the steps.

④ Find the distance from $(3, -2)$ to $(4, 9)$.

⑤ Test for symmetry and sketch $x = \frac{1}{2}y^2$.

⑥ List the intercepts of $16x^2 + 9y^2 = 144$ and sketch.

⑦ Sketch $y = \frac{2}{3}x - 4$.
 Avoid fractional values.

⑧ Find the equation of a vertical line through $(-3, 8)$

⑨ The value V of a business machine is decreasing linearly. It is now worth \$10,000 and it will have a salvage value in 10 years of \$1,000. Find

an equation that expresses the value V , in terms of t , the number of years from now.

⑩ Find an equation of the line through $(-1, 3)$ and perpendicular to $y = 5x - 2$, in $y = mx + b$ form.

⑪ Find the center and radius of $x^2 - 6x + y^2 + 8y = -16$.

⑫ If $G(x) = x^2 + 2x - 5$, find and simplify $G(x+1)$.

⑬ Find the domain of $f(x) = \sqrt{3x+2}$.

⑭ If $f(x) = \frac{1}{x-3}$, $g(x) = \sqrt{x}$ find $(f-g)(x)$ and its domain.