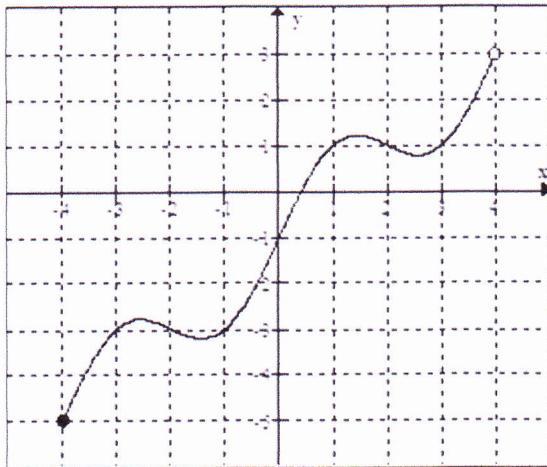


ARE YOU READY FOR MTH 111?

Below are some skills you should have before taking MTH 111.

- 1) Use the graph of the function $f(x)$ below to answer the questions.



$f(x)$

- State the domain.
 - State the range.
 - Evaluate $f(2)$.
 - Solve $f(x) = 1$
 - Solve $f(x) \leq -1$
- 2) Algebraically determine the domain of $\sqrt{x+5}$. Sketch a graph and clearly label both x and y intercepts.
- 3) Find a linear function $f(x)$ such that $f(-2) = 11$ and $f(4) = -1$.
- 4) Write $y = x^2 - 6x + 7$ in vertex form by completing the square. Identify the vertex. $y = a(x - h)^2 + k$
- 5) Solve $|-2x + 7| > 1$ using a graphing calculator. State the solution set using interval notation and sketch your graph to prove it.
- 6) Solve $\sqrt{2x + 18} + 3 = x$ algebraically.

7) Solve $-5 < -2x + 3 < 6$ algebraically and graph your solution set on a number line.

8) Solve $\frac{3}{x} + x = -4$ algebraically.

9) Solve $5x^2 - 4x = -1$ using the quadratic formula $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$.

10) Simplify and write your answer with positive, rational exponents. $3x^{\frac{1}{3}}x^{-2}$

11) Write the expression using a radical. $x^{\frac{4}{5}}$

Simplify:

12) $\frac{2x+4}{x^2-5x+6} \div \frac{x^2+4x+4}{4x-8}$

13) $\frac{x+2}{x-1} - \frac{x+3}{x+4}$

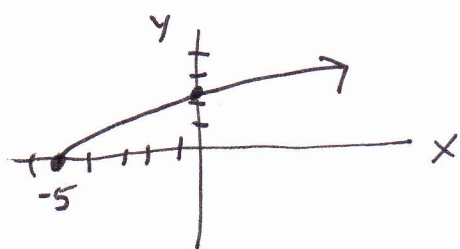
14) $\frac{\frac{1}{x}}{\frac{3}{x}+2}$

SOLUTIONS

R U Ready
4 MTH111?

- ① a) $[-4, 4]$
 b) $[-5, 3]$
 c) $f(x)=1$
 d) $f(x)=1 \quad \{1, 2, 3\}$
 e) $[-4, 0]$

② $x+5 \geq 0$
 $x \geq -5$



x int $(-5, 0)$
 y int $(0, \sqrt{5})$

③ $f(-2)=11$
 $f(4)=-1$
 $\frac{11-(-1)}{-2-4} = \frac{12}{-6} = -2$

$y = mx + B$
 $-1 = (-2)(4) + B$
 $-1 = -8 + B$
 $7 = B$

$f(x) = -2x + 7$

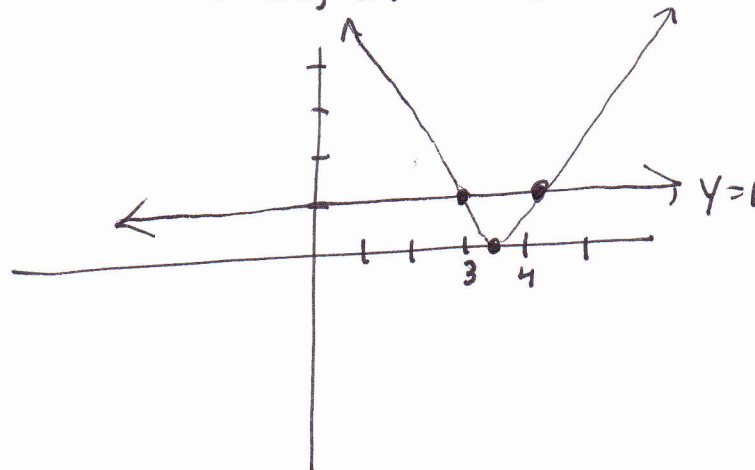
④ $x^2 - 6x + 9 - 9 + 7$

$y = (x-3)^2 - 2$

$V(3, -2)$

⑤ $|-2x+7| > 1$

$(-\infty, 3) \cup (4, \infty)$



⑥ $\sqrt{2x+18} + \frac{3}{-3} = \frac{x}{-3}$

$(\sqrt{2x+18})^2 = (x-3)^2$

$2x+18 = x^2 - 6x + 9$
 $-2x - 18 \quad -2x - 18$

$0 = x^2 - 8x - 9$

$0 = (x-9)(x+1)$

$x = 9, -1$

check... only $x=9$ ✓

⑦

$-5 < -2x + \frac{3}{-3} < \frac{6}{-3}$

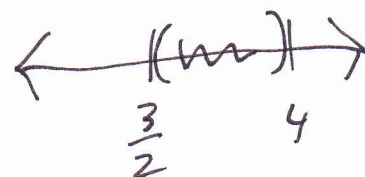
$-\frac{8}{-2} < \frac{-2x}{-2} < \frac{3}{-2}$

Flip!

$4 > x > \frac{3}{2}$

or

$\frac{3}{2} < x < 4$



{Solutions}

$$\textcircled{8} \left[\frac{3}{x} + x = -4 \right] x$$

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

$$\quad +4x \quad +4x$$

$$x^2 + 4x + 3 = 0$$

$$(x+3)(x+1) = 0$$

$$\boxed{x = -3, -1}$$

$$\textcircled{9} 5x^2 - 4x = -1$$

$$\quad +1 \quad +1$$

$$5x^2 - 4x + 1 = 0$$

$$a=5 \quad b=-4 \quad c=1$$

$$\frac{4}{2(5)} \pm \frac{\sqrt{16 - 4(5)(1)}}{2(5)}$$

$$\frac{4}{10} \pm \frac{\sqrt{-4}}{10}$$

$$\frac{4}{10} \pm \frac{2i}{10}$$

$$\boxed{\frac{2}{5} \pm \frac{i}{5} \text{ or } \frac{2 \pm i}{5}}$$

$$\textcircled{10} 3x^{\frac{1}{3}-2}$$

$$3x^{\left(\frac{1}{3}-2\right)}$$

$$3x^{\left(\frac{1}{3}-\frac{2}{1}\right)}$$

$$3x^{\left(\frac{1}{3}-\frac{6}{3}\right)} = 3x^{-5/3}$$

$$\boxed{\frac{3}{x^{5/3}}}$$

$$\textcircled{11} x^{4/5} = \sqrt[5]{x^4}$$

$$\textcircled{12} \frac{2(x+2)}{(x-2)(x-3)} \cdot \frac{4(x-2)}{(x+2)(x+2)}$$

$$= \frac{8}{(x-3)(x+2)}, x \neq 2$$

$$\textcircled{13} \frac{x+2}{x-1} - \frac{x+3}{x+4}$$

$$\frac{(x+2)(x+4) - (x+3)(x-1)}{(x-1)(x+4)}$$

$$\frac{x^2 + 6x + 8 - (x^2 + 2x - 3)}{(x-1)(x+4)}$$

$$\boxed{\frac{4x + 11}{(x-1)(x+4)}}$$

$$\textcircled{14} \frac{\frac{1}{x}}{\frac{3}{x} + \frac{2 \cdot x}{1 \cdot x}} = \frac{\frac{1}{x}}{\frac{3}{x} + \frac{2x}{x}}$$

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

$$\boxed{= \frac{1}{3+2x}, x \neq 0}$$