

BE-PRECALC | 9-29-09 TUESDAY

ACT
2009/10
PT

① WHAT IS THE SLOPE of the line
parallel to $y = \frac{2}{3}x - 4$ in the
STANDARD (x, y) COORDINATE PLANE?

② $f(x) = 4x + 1$, $g(x) = x^2 - 2$
Find $f(g(x))$

③ Which number is RATIONAL?

Ⓐ $\sqrt{2}$ Ⓑ $\sqrt{\pi}$ Ⓒ $\sqrt{7}$ Ⓓ $\sqrt{\frac{5}{25}}$ Ⓔ $\sqrt{\frac{64}{49}}$

ANS

① $m_{\parallel} = \frac{2}{3}$

② $f(x) = 4x + 1$

③ $\sqrt{\frac{64}{49}}$

$$f(x^2 - 2) = 4(x^2 - 2) + 1 = \frac{\sqrt{64}}{\sqrt{49}}$$

$$= 4x^2 - 8 + 1$$

$$= \boxed{4x^2 - 7}$$

$$= \boxed{\frac{8}{7}}$$

RATIONAL

• Homework review $\Rightarrow$ find d, explain:
Pg. 219 # 5-10, 12, 16, 19.

Quadratic Formula $\Rightarrow$
$$x = \frac{-b \pm \sqrt{d}}{2a}$$



"NUKE" ANY QE!

Pg 219

#5 $x^2 + 8x - 20 = 0$

$a = 1$

$b^2 - 4ac$

$b = 8$

$(8)^2 - 4(1)(-20)$

$c = -20$

$64 + 80 = 144 = d$

Perfect Square

$$x = \frac{-b \pm \sqrt{d}}{2a} = \frac{-(8) \pm 12}{2(1)}$$

$x = \{2, -10\}$

2 rational roots

NOTE:

$(x-2)(x+10) = 0$

#6 $2a^2 + 11a - 21 = 0$

$a = 2$

$b^2 - 4ac$

$b = 11$

$(11)^2 - 4(2)(-21)$

$c = -21$

$121 + 168 = 289 = d$

Perfect Square

$$x = \frac{-b \pm \sqrt{d}}{2a} = \frac{-(11) \pm 17}{2(2)} = \frac{-11 \pm 17}{4}$$

$x = \left\{\frac{2}{3}, -7\right\}$

NOTE: $(x - \frac{2}{3})(x + 7) = 0$

$(3x - 2)(x + 7) = 0$

$$\textcircled{7} \quad m^2 + 12m + 36 = 0 \quad \left. \begin{array}{l} \downarrow \checkmark \quad 2 \cdot 6 \cdot m \checkmark \\ (m + 6)^2 = 0 \end{array} \right\} \text{PERFECT SQUARE TRINOMIAL}$$

$$(m+6)(m+6) = 0 \quad m = \{-6\}$$

$$\begin{array}{l} a=1 \\ b=12 \\ c=36 \end{array} \quad \begin{array}{l} b^2 - 4ac \\ (12)^2 - 4(1)(36) \\ 144 - 144 = 0 = d \end{array} \quad \begin{array}{l} \text{ONE} \\ \text{RATIONAL} \\ \text{ROOT} \end{array}$$

$$m = \frac{-b \pm \sqrt{d}}{2a} = \frac{-(12) \pm 0}{2(1)}$$

$$= \frac{-12}{2} = \boxed{-6}$$

THE PARABOLA TOUCHES THE X-AXIS AT ONE POINT

$$\textcircled{8} \quad t^2 - 6t + 13 = 0$$

$$\begin{array}{l} a=1 \\ b=-6 \\ c=13 \end{array} \quad \begin{array}{l} b^2 - 4ac \\ (-6)^2 - 4(1)(13) \\ 36 - 52 = -16 = d \end{array} \quad \begin{array}{l} \text{Complex} \\ \text{Roots} \end{array}$$

$$x = \frac{-b \pm \sqrt{d}}{2a} = \frac{-(-6) \pm \sqrt{-16}}{2(1)}$$

Since $\sqrt{-16} = \sqrt{-1} \sqrt{16} = i4 \text{ or } 4i$

$$x = \frac{6 \pm 4i}{2} = \boxed{\{3+2i, 3-2i\}}$$

PARABOLA NEVER CROSSES THE X-AXIS

- Homework:
- Memorize the QF
 - Solve the problems from yesterday using the QF
Skip 5-8
- ⇒ Pg 219 # 9, 10, 12, 16, 19.