

Aim: How do we prepare for the math college placement exam (Trinity)?

Get Ready: Begin the Trinity College Placement Review Packet.

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

1. a) $\frac{1}{2-x}$ b) $\frac{1}{2+x}$ c) $\frac{x+2}{4-x^2}$ d) $\frac{2x-5}{4-x^2}$ e) $\frac{3x+2}{4-x^2}$

Solve for y: $y^2 + 5y - 6 = 0$ $(y+6)(y-1) = 0$ $y = -6$ $y = 1$

2. a) $\{-1, 6\}$ b) $\{-1, -6\}$ c) $\{-6, 1\}$ d) $\{2, -3\}$ e) $\{2, 3\}$

Find the value of k for which $x^2 + 8x + k$ is a perfect square. → HALF OF THE MIDDLE TERM SQUARED IS EQUAL TO THE LAST

3. a) 3 b) 4 c) 9 d) 12 e) 16

$\frac{8}{2} = 4$ $4^2 = 16$

$x^2 + 8x + 16 = (x+4)^2$
↑ SQUARE TRINOMIAL ↑ BINOMIAL SQUARED

Find the value of $(-27)^{2/3} = (\sqrt[3]{-27})^2 = (-3)^2 = 9$

4. a) 9 b) $3\sqrt{3}$ c) $\frac{1}{9}$ d) -9 e) -243

5. The value of 83 coins consisting of dimes and nickels is \$5.75. Find the number of nickels.

$x = \text{NICKEL}$ $y = \text{DIMES}$
 $x + y = 83$
 $0.05x + 0.10y = 5.75$
 $y = 83 - x$
 $0.05x + 0.10(83 - x) = 5.75$
 $0.05x + 8.3 - 0.10x = 5.75$
 $-0.05x = -2.55$
 $x = 51$

5. a) 15 nickels b) 32 nickels c) 51 nickels d) 53 nickels e) 57 nickels

6. Find the value of $(3)(2^n)(5^k)$ if $n = -3$ and $k = 0$

$(3)(2^{-3})(5^0) = 3 \cdot \frac{1}{2^3} \cdot 1 = \frac{3}{8}$

6. a) $\frac{1}{24}$ b) $\frac{3}{8}$ c) $-\frac{3}{8}$ d) -24 e) -216

Simplify: $\sqrt{18} + \sqrt{8} = \sqrt{9} \sqrt{2} + \sqrt{4} \sqrt{2} = 3\sqrt{2} + 2\sqrt{2} = 5\sqrt{2}$

7. a) $5\sqrt{2}$ b) $6\sqrt{2}$ c) $36\sqrt{2}$ d) $\sqrt{50}$ e) $2\sqrt{3} + 2\sqrt{2}$

Solve for both x and y:

ELIMINATION

$3y + 2x = 20$

$3y + 2x = 20$

$-3(y - 4x = 9)$

$-3y + 12x = -27$

$14x = -7$

8. a) $(\frac{47}{14}, \frac{157}{7})$ b) $(\frac{1}{2}, 11)$ c) $(-\frac{1}{7}, \frac{59}{7})$ d) $(-\frac{1}{2}, 7)$ e) $(-2, 1)$

OR

SUBSTITUTION

$y = 4x + 9 \rightarrow 3(4x + 9) + 2x = 20$

$12x + 27 + 2x = 20$

$14x = -7$

$x = -\frac{7}{14} = -\frac{1}{2}$

Aim: How do we prepare for the math college placement exam (Trinity)?

Find the length of the line segment joining points $A(-2,3)$ and $B(6,9)$.

$$d^2 = (\Delta y)^2 + (\Delta x)^2$$

$$d^2 = (y - y_1)^2 + (x - x_1)^2$$

$$d^2 = (9 - 3)^2 + (6 - (-2))^2$$

$$d^2 = 6^2 + 8^2$$

$$d^2 = 36 + 64$$

$$d^2 = 100$$

$$d = 10$$

9. a) $\frac{3}{4}$ b) $\sqrt{52}$ **c) 10** d) 12 e) $\sqrt{157}$

5. Find an equation of the line through $P(4,5)$ with slope $m = -3$.

10. a) $y = 3x - 17$ b) $y = \frac{5}{4}x - 3$ c) $y = -3x + 5$ d) $y = -3x + 7$ **e) $y = -3x + 17$**
- Two ways
- ① $y - y_1 = m(x - x_1)$ ← POINT-SLOPE FORM
- $$y - 5 = -3(x - 4)$$
- $$y - 5 = -3x + 12$$
- $$y = -3x + 17$$
- SLOPE INTERCEPT
- $$y = -3x + b \rightarrow y = -3x + 17$$
- $$5 = -3(4) + b$$
- $$17 = b$$

Find $|1 - |x||$, if $x = -7$.

11. a) -8 b) -6 **c) 6** d) 7 e) 8
- ABS. VALUE $\rightarrow |1 - |-7|| = |1 - 7| = |-6| = 6$

Find $g(f(13))$, if $f(x) = 3x + 1$ and $g(x) = \sqrt{x + 9}$

12. a) -7 **b) 7** c) $\sqrt{48}$ d) $40\sqrt{22}$ e) $(3\sqrt{22} + 1)$
- $$f(13) = 3(13) + 1 = 40$$
- $$g(40) = \sqrt{40 + 9} = \sqrt{49} = 7$$

13. Which of the following is sets is the domain of H ?

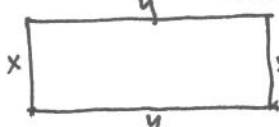
$$H(x) = \frac{\sqrt{x+2}}{x-4} \rightarrow \sqrt{x+2} \rightarrow x+2 \geq 0 \quad x \geq -2$$

$$x-4 \rightarrow x-4 \neq 0 \quad x \neq 4$$

$$\left. \begin{array}{l} x \geq -2 \\ x \neq 4 \end{array} \right\} \{x \mid x \geq -2 \text{ and } x \neq 4\}$$

- a) $\{x \mid x \text{ is a real number}\}$ b) $\{x \mid x \neq 4\}$ c) $\{x \mid x \geq 2 \text{ and } x \neq 4\}$ d) $\{x \mid x \geq -2 \text{ and } x \neq 4\}$
- e) $\{x \mid x > -2 \text{ and } x \neq 4\}$**

1. A rectangular field of length x and width y is surrounded by a fence of length 240 feet. Express the field's area A as a function of x alone.

14. a) $A = 120x - 2x^2$ **b) $A = 120x - x^2$** c) $A = 240x - x^2$ d) $A = 240x - 2x^2$ e) $A = \frac{240}{x}$
- 
- $2x + 2y = 240$
- $$2y = 240 - 2x$$
- $$y = 120 - x$$
- SUBST.
- $$\text{AREA} = xy$$
- $$\text{AREA} = x(120 - x)$$
- $$A = 120x - x^2$$
- Solve for x : $|3x - 2| = 10$

15. a) $\left\{-\frac{8}{3}, \frac{8}{3}\right\}$ b) $\{-4, 4\}$ c) $\left\{-4, -\frac{8}{3}\right\}$ **d) $\left\{4, -\frac{8}{3}\right\}$** e) $\left\{4, \frac{8}{3}\right\}$
- $$3x - 2 = 10$$
- $$3x = 12$$
- $$x = 4$$
- $$-(3x - 2) = 10$$
- $$-3x + 2 = 10$$
- $$-3x = 8$$
- $$x = -\frac{8}{3}$$