

Accuplacer – College-Level Mathematics

Mixed Practice Module #2

For each of the questions below, choose the best answer from the five choices given. Use scratch paper as needed.

$a=1$ $b=-3$ $c=-8$

1. A root of $x^2 - 3x - 8 = 0$ is?

a. $\frac{3+\sqrt{23}}{2}$

b. $\frac{3-\sqrt{23}}{2}$

c. $\frac{3-\sqrt{41}}{2}$

d. $\frac{-3+\sqrt{41}}{2}$

e. $\frac{-3-\sqrt{23}}{2}$

option A:
Quad. Formula
 $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
 $x = \frac{-(-3) \pm \sqrt{(-3)^2 - 4(1)(-8)}}{2(1)}$
 $x = \frac{3 \pm \sqrt{9+32}}{2} = \frac{3 \pm \sqrt{41}}{2}$

option B
complete the square
 $x^2 - 3x - 8 = 0$
 $x^2 - 3x + \square = 8 + \square$
 $\square = \left(\frac{b}{a}\right)^2$
 $= \left(\frac{-3}{2}\right)^2$
 $= 9/4$

2. For what real number x is the value of $x^2 + 3x - 18$ negative?

a. $-6 < x < 3$

b. $-6 < x < 3$

c. $x < -6$ or $x > 3$

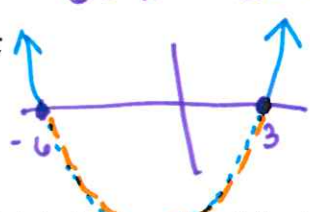
d. $x = -6$ or $x = 3$

e. For no real numbers x

Find the zeros!
 $0 = x^2 + 3x - 18$ FACTOR!
 $0 = (x+6)(x-3)$
 $0 = x+6$ $0 = x-3$
 $-6 = x$ $3 = x$

+x²
parabola
opens
up!

"value" means "y" value!



$x^2 - 3x + \frac{9}{4} = 8 + \frac{9}{4}$
FACTOR!
 $\left(x - \frac{3}{2}\right)^2 = \frac{32}{4} + \frac{9}{4}$
 $\sqrt{\left(x - \frac{3}{2}\right)^2} = \sqrt{\frac{41}{4}} = \frac{\sqrt{41}}{2}$
 $x - \frac{3}{2} = \pm \frac{\sqrt{41}}{2}$
 $x = \frac{3 \pm \sqrt{41}}{2}$

3. If $f(x) = 2x - 5$ and $f^{-1}(x)$ is the inverse of f , what is the value of $f^{-1}(2)$?

a. -5

b. $-\frac{7}{2}$

c. $\frac{5}{2}$

d. $\frac{7}{2}$

e. 5

$f^{-1}(x): x = 2y - 5$
 $x + 5 = 2y$
 $\frac{x+5}{2} = y$
 $f^{-1}(x) = \frac{x+5}{2}$

$f^{-1}(2) = \frac{(2)+5}{2}$
 $f^{-1}(2) = \frac{7}{2}$

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4. If $f(x) = 3x - 1$ and $g(x) = \frac{x+1}{3}$ then $f(g(x)) =$

✓ a. x

b. 0

c. $\frac{x+1}{9x-3}$

d. $\frac{9x-3}{x+1}$

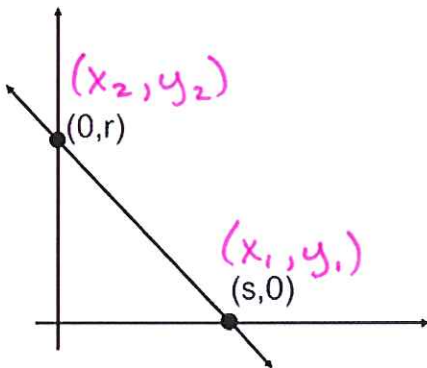
e. $\frac{(3x-1)(x+1)}{3}$

$$f(g(x)) = f\left(\frac{x+1}{3}\right) = 3\left(\frac{x+1}{3}\right) - 1$$

$$= x + 1 - 1$$

$$f(g(x)) = x$$

5. If an equation of the linear function in the figure below is $y = mx + b$, then $m =$



$$m = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1}$$

$$= \frac{r - 0}{0 - s}$$

$$= \frac{r}{-s}$$

$$m = -\frac{r}{s}$$

✓ a. $-\frac{r}{s}$

b. $\frac{r}{s}$

c. rs

d. r

e. $-s$