

Sec 3 FINAL Review 3

Part I: Matching

Match rational expressions on the left with their simplified form on the right.

e. 1) $\frac{x-4}{x+4} \cdot \frac{x-4}{x+5}$ a) $\frac{x+4}{x+5}$

$\frac{\cancel{x-4}}{x+4} \cdot \frac{\cancel{x-4}}{x+5} = \frac{x+5}{x+4}$

b. 2) $\frac{3x+6}{x^2+6x+8} = \frac{3(x+2)}{(x+2)(x+4)} = \frac{3}{x+4}$

$\frac{2 \cancel{8}}{\cancel{6}}$

d. 3) $\frac{3}{x+1} + \frac{2(x+4)}{x-4}$ c) $\frac{17x+4}{x^2+x-20}$

$\frac{3x+12+2x+8}{(x+1)(x-4)} = \frac{5x+20}{x^2-16}$

c. 4) $\frac{(x+5)(x+4)}{(x-4)(x+5)} - \frac{x-4}{x+5}$ d) $\frac{5x-4}{x^2-16}$

$\frac{\cancel{x+5}(x+4) - (x-4)\cancel{(x+5)}}{(x-4)(x+5)} = \frac{17x+4}{x^2+x-20}$

a. 5) $\frac{x^2-16}{x^2+x-20} = \frac{(x+4)(x-4)}{(x+5)(x+4)} = \frac{x-4}{x+5}$

$\frac{5 \cancel{20}}{\cancel{1}}$

e) $\frac{x+5}{x+4}$

- d 6) If $9^x = 1$, then...
- a) $x = 9$ b) $x = \frac{1}{9}$ c) $x = 1$ d) $x = 0$

- b 7) If $143^{-7x-1} = 143^{-5x+7}$, then
- a) $x = 2$ b) $x = -4$ c) $x = 2$ d) $x = 4$
- Handwritten work:*
 $-7x - 1 = -5x + 7$
 $-7x + 5x = 7 + 1$
 $-2x = 8$
 $x = -4$

- d 8) Re-Write in logarithmic form: $4^3 = 64$
- a) $\log_3 4 = 64$ b) $\log_3 64 = 4$ c) $4\log 3 = 64$ d) $\log_4 64 = 3$

- d 9) Which of the following would not simplify to give you b^4 ?
- a) $b^3 \cdot b$ b) $b^7 \div b^3$ c) $b^2 \cdot b \cdot b$ d) $b^7 - b^3$

- a 10) Which of the following is the inverse of $f(x) = 5^x$?
- a) $f^{-1}(x) = \log_5 x$ b) $f^{-1}(x) = \sqrt[3]{5}$ c) $f^{-1}(x) = \sqrt[5]{x}$ d) $f^{-1}(x) = \log_x 5$

- a, b, d 11) Which of the following will not simplify to give you the same answer as $\sqrt[4]{x^8}$?
- a) $x^{\frac{1}{2}} \cdot x^4$ X b) $\frac{x^2 \cdot x^6}{x^6}$ X c) $\sqrt{x^4}$ ✓ d) $\frac{x^6}{x^3}$ ✓
- Handwritten notes:*
 $x^{\frac{8}{4}} = x^2$
 $6 - 3 = 3$

- C 12) If you know that $f(x) + g(x) = x^2 - x + 3$ then which of the following are possibilities for $f(x)$ and $g(x)$?

a) $f(x) = x^2 + 3$ and $g(x) = x$

b) $f(x) = x^2 + 5x - 3$ and $g(x) = -x^2 - 4x + 3$

c) $f(x) = 3x^2 - 2x + 5$ and $g(x) = -2x^2 + x - 2$

d) $f(x) = 5x^3 - 4x^2 + 10x - 2$ and $g(x) = -5x^3 + 4x^2 - 9x + 5$

- b 13) Select the function below that has the roots of +3 and -4.
- a) $f(x) = (x+3)(x+4)$ b) $f(x) = (x-3)(x+4)$
 c) $f(x) = (x+3)(x-4)$ d) $f(x) = (x-3)(x-4)$

D. 14) Select the function below that has roots of -2 and 6.

a) $f(x) = x^2 - 12x + 4$

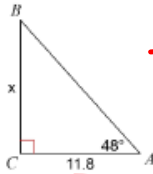
b) $f(x) = x^2 - 4x - 12$

c) $f(x) = x^2 + 4x - 12$
 $(x+6)(x-2)$

d) $f(x) = x^2 - 2x - 16$

$(x-6)(x+2)$
 $6, -2$

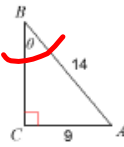
A. 15) Find the missing side.



$\tan 48 = \frac{x}{11.8}$

- A) 13.1
- B) 16.1
- C) 13.7
- D) 15.8

16) Find the missing angle.

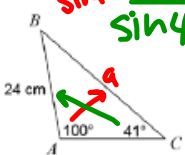


$\sin^{-1}(\frac{9}{14}) =$

- A) 42.2°
- B) 32.8°
- C) 40°
- D) 44.6°

C. 17) Find the missing side.

Find BC

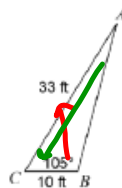


$\frac{\sin 100}{24} = \frac{\sin 41}{a}$

- A) 39 cm
- B) 37 cm
- C) 36 cm
- D) 34 cm

C. 18) Find the missing angle.

Find $m\angle A$



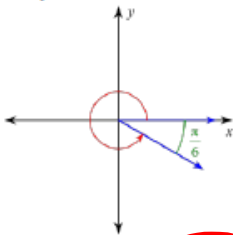
$\frac{\sin A}{10} = \frac{\sin 105}{33}$

$A = \sin^{-1}(.2927)$

- A) 23°
- B) 18°
- C) 17°
- D) 16°

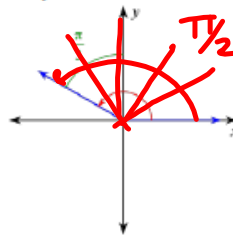
Find the measure of the angle. (positive direction from 0).

S. 19)



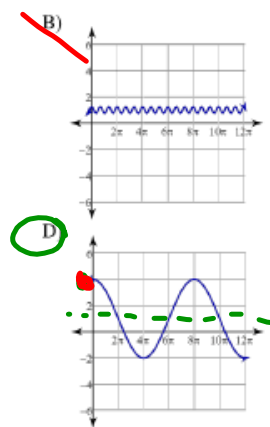
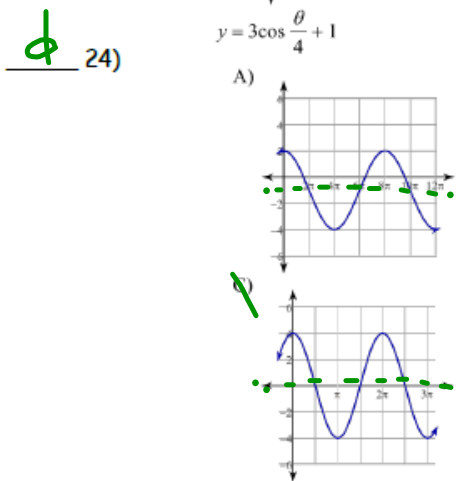
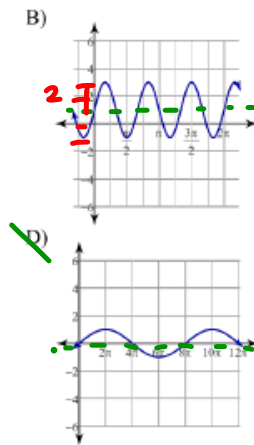
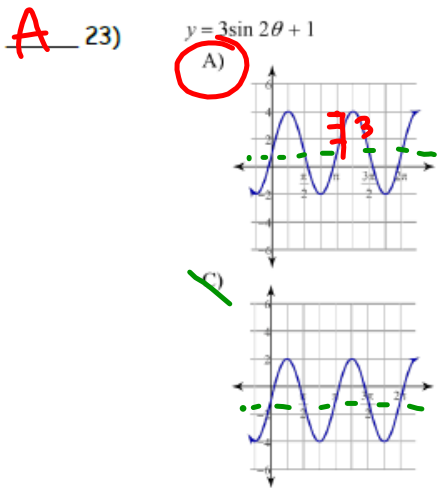
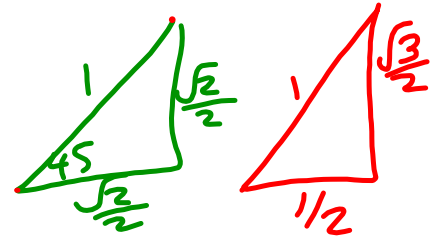
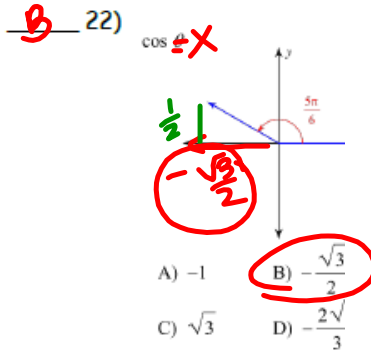
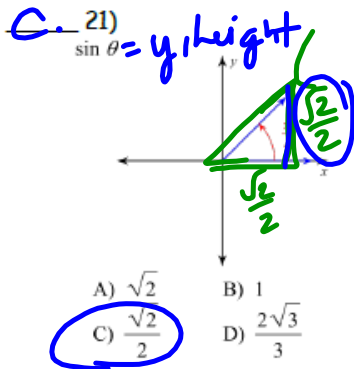
- A) $\frac{7\pi}{6}$
- B) $\frac{11\pi}{6}$
- C) $-\frac{11\pi}{6}$
- D) $\frac{67\pi}{36}$

C. 20)



$\frac{\pi}{2} + \frac{\pi}{3} = \frac{5\pi}{6}$

- A) $\frac{4\pi}{3}$
- B) $\frac{3\pi}{4}$
- C) $\frac{5\pi}{6}$
- D) $\frac{2\pi}{9}$

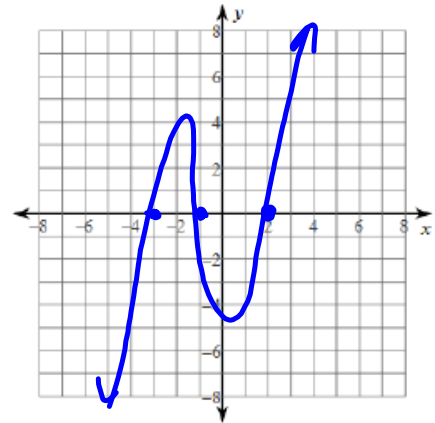


25) Write a polynomial that has a leading coefficient of 1, and the following zeros: 2, -1, -3

a) factored form $(x-2)(x+1)(x+3)$

$$\begin{array}{l}
 x^2 - 2x + x - 2 \\
 (x^2 - x - 2)(x+3) \\
 \begin{array}{r}
 x \quad \begin{array}{|c|c|c|}
 \hline
 x^2 & -x^2 & -2x \\
 \hline
 +3 & 3x^2 & 3x & -6 \\
 \hline
 \end{array}
 \end{array}
 \end{array}$$

b) standard form $x^3 + 2x^2 - 5x - 6$



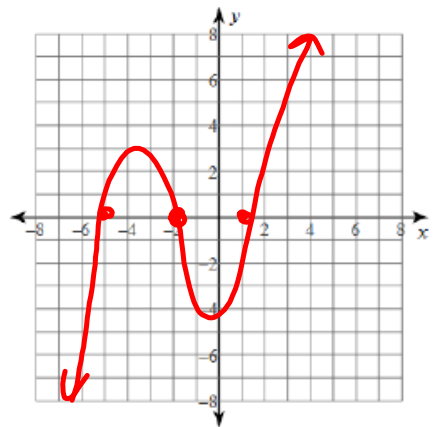
Factor Completely. (5 points each)

26) standard form: $x^3 + 6x^2 + 3x - 10$ given $(x+2)$ is a factor. (long division)

$$\begin{array}{r}
 x^2 + 4x - 5 \\
 x+2 \overline{) x^3 + 6x^2 + 3x - 10} \\
 \underline{-x^3 - 2x^2} \\
 4x^2 + 3x - 10 \\
 \underline{-4x^2 - 8x} \\
 -5x - 10 \\
 \underline{+5x + 10} \\
 0
 \end{array}$$

~~$\begin{array}{r} 5 \\ -1 \end{array}$~~

Factored form: $(x+2)(x-1)(x+5)$
 Zeros: $-2, 1, -5$



Part II: Short Answer (27-30)

$$\underline{f(x) = x + 3}, \quad \underline{g(x) = 3x - 4}, \quad \text{and} \quad \underline{h(x) = x^2 + 2x - 1}$$

27) $f(x) + g(x)$

$$x+3 + 3x-4$$

$$\boxed{4x-1}$$

28) $h(x) - g(x)$

$$x^2+2x-1 - (3x-4)$$
$$-3x+4$$

$$\boxed{x^2-x+3}$$

29) $f(x) \cdot g(x)$

$$(x+3)(3x-4)$$

$$3x^2+9x-4x-12$$

$$\boxed{3x^2+5x-12}$$

30) $f(g(x))$

$$(3x-4)+3$$

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