1033 Final Exam Practice - Video Guide

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Simplify the rational expression.

1) $\dfrac{4x + 2}{12x^2 + 26x + 10}$

1) _____

2) $\dfrac{4x^2 + 12x^3}{11x + 33x^2}$

2) _____

Multiply or divide as indicated. Simplify completely.

3) $\dfrac{9x^4 - 72x}{3x^2 - 12} \cdot \dfrac{x^2 + x - 2}{4x^3 + 8x^2 + 16x}$

3) _____

4) $\dfrac{x^2 - 11x + 30}{x^2 - 16x + 63} \cdot \dfrac{x^2 - 11x + 28}{x^2 - 13x + 40}$

4) _____

5) $\dfrac{x^2 - 11x + xy - 11y}{3x^2 - 3y^2} \div \dfrac{x - 11}{12x - 12y}$

5) _____

6) $\dfrac{x^2 - 14x + 49}{4x - 28} \div \dfrac{11x - 77}{44}$

6) _____

Simplify.

7)

$\dfrac{\dfrac{5}{x} + 4}{\dfrac{25}{x^2} - 16}$

7) _____

8)

$\dfrac{4 + \dfrac{2}{x}}{\dfrac{x}{4} + \dfrac{1}{8}}$

8) _____

Use radical notation to write the expression. Simplify if possible.

9) $(81x^6)^{1/2}$

9) _____

10) $\left(\dfrac{1}{81}\right)^{1/4}$

10) _____

11) $81^{5/4}$

11) _____

Use the properties of exponents to simplify the expression. Write with positive exponents.

12) $\dfrac{x^{3/2} \cdot x^{3/5}}{x^{5/7}}$

12) _____

Simplify the radical expression. Assume that all variables represent positive real numbers.

13) $\sqrt{75k^7 q^8}$

13) _____

14) $\sqrt[5]{1024\, x^3\, y^{19}}$

14) _____

Perform the indicated operation. Write the result in the form a + bi.

15) $(7 - 4i)^2$

15) _____

16) $(24 - 8i)(3 + i)$

16) _____

17) $\dfrac{7 + 8i}{3 + 4i}$

17) _____

Solve.

18) Shelly can cut a lawn with a riding mower in 3 hours less time than it takes William to cut the lawn with a push mower. If they can cut the lawn in 7 hours working together find how long to the nearest tenth of an hour it takes for William to cut the lawn alone.

18) _____

Sketch the graph of the quadratic function by finding the vertex, intercepts, and determining if the graph opens upward or downward.
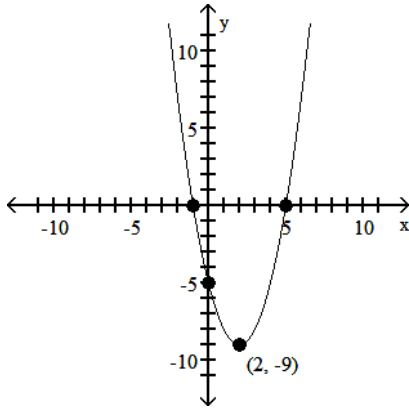
19) $f(x) = 2x^2 - 8x$

19) _____
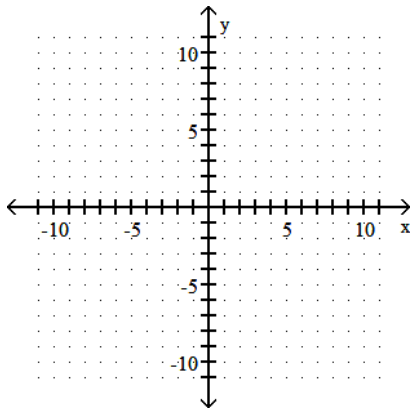
MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.
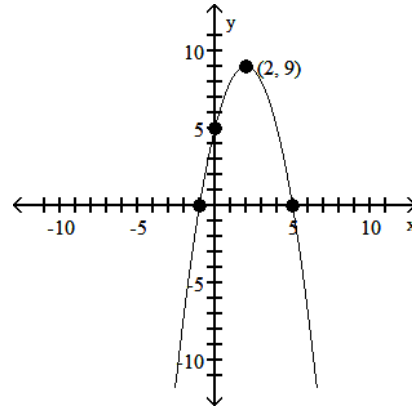
Match the function with its graph.

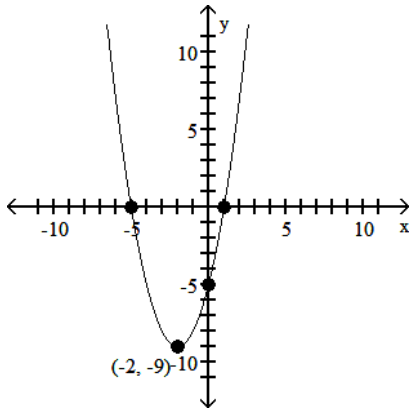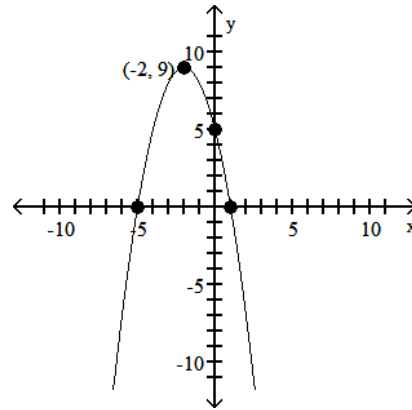20) $f(x) = x^2 - 4x - 5$

20) _____

A)

(2, -9)

B)

(2, 9)

C)

(-2, -9)

D)

(-2, 9)

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question.

Use the quadratic formula to solve the equation.

21) $x^2 + 16x + 42 = 0$
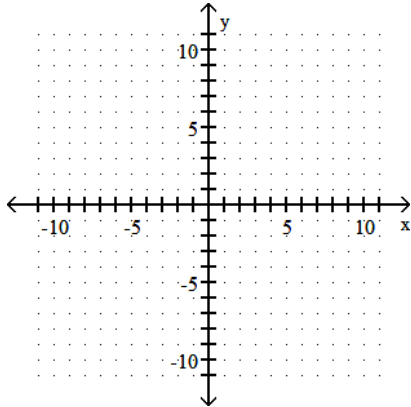
21) _____

22) $2x^2 + 6x = -3$

22) _____

Solve.

23) An arrow is fired into the air with an initial velocity of 160 feet per second. The height in feet of the arrow t seconds after it was shot into the air is given by the function

$h(t) = -16t^2 + 160t$. Find the maximum height of the arrow.

23) _____

3

Sketch the graph of the quadratic function. Give the vertex and axis of symmetry.
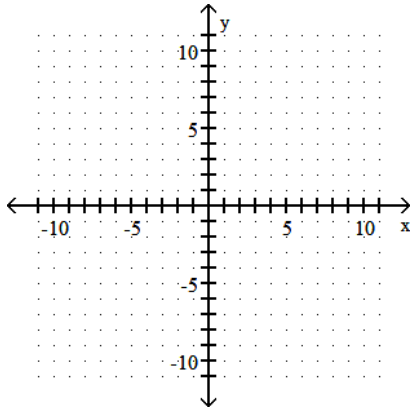
24) $f(x) = x^2 - 2$

24) _____

25) $f(x) = -4(x + 6)^2 - 5$

25) _____

Find the vertex of the graph of the quadratic function.

26) $f(x) = -4x^2 - 8x - 3$

26) _____

27) $f(x) = x^2 - 3x + 3$

27) _____

Solve the system of equations.

28)

$$\begin{cases} x + 4y = -14 \\ 7x + 3y = -23 \end{cases}$$

28) _____

29)

$$\begin{cases} -x + 4y = -3 \\ 6x - 24y = 5 \end{cases}$$

29) _____

30)

$$\begin{cases} x + 7y = 42 \\ -6x + 6y = -12 \end{cases}$$

30) _____

4

Solve.

31) A chemist needs 70 milliliters of a 42% solution but has only 32% and 67% solutions available. Find how many milliliters of each that should be mixed to get the desired solution.

31) _____

32) University Theater sold 537 tickets for a play. Tickets cost $21 per adult and $15 per senior citizen. If total receipts were $9231, how many senior citizen tickets were sold?
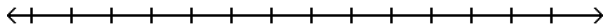
32) _____

33) The manager of a bulk foods establishment sells a trail mix for $5 per pound and premium cashews for $13 per pound. The manager wishes to make a 240-pound trail mix-cashew mixture that will sell for $8 per pound. How many pounds of each should be used?
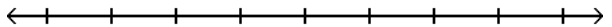
33) _____

Solve the compound inequality. Graph the solution set.

34) $x \leq 4$ and $x \leq 3$

34) _____

35) $9x < 27$ and $x + 9 > 10$

35) _____

36) $x + 8 < 7$ and $-8x < -24$

36) _____

37) $x \leq 4$ or $x \geq 7$

37) _____

38) $-7x + 1 \geq 15$ or $6x + 3 \geq -21$

38) _____

1) $\dfrac{1}{3x + 5}$

2) $\dfrac{4x}{11}$

3) $\dfrac{3(x - 1)}{4}$

4) $\dfrac{(x - 6)(x - 4)}{(x - 9)(x - 8)}$

5) 4

6) 1

7) $\dfrac{x}{5 - 4x}$

8) $\dfrac{16}{x}$

9) $9x^3$

10) $\dfrac{1}{3}$

11) 243
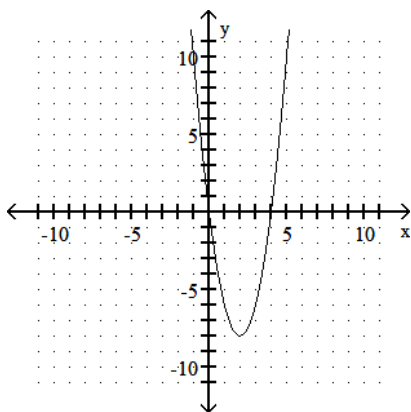
12) $x^{97/70}$

13) $5k^3 q^4 \sqrt{3k}$

14) $4y^3 \sqrt[5]{x^3 y^4}$

15) $33 - 56i$

16) $80 + 0i$

17) $\dfrac{53}{25} - \dfrac{4}{25}i$

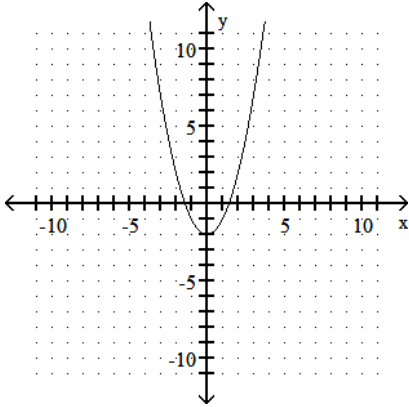18) 15.7 hr

19)

20) A

21) $-8 - \sqrt{22}, -8 + \sqrt{22}$
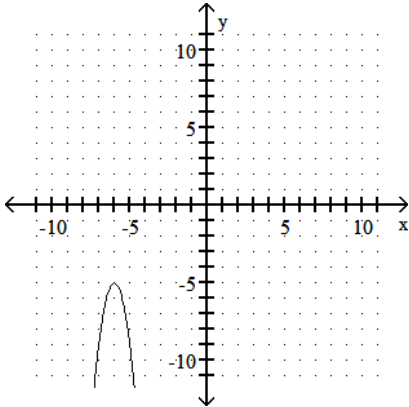
22) $\dfrac{-3 - \sqrt{3}}{2}, \dfrac{-3 + \sqrt{3}}{2}$

23) 400 ft

24) vertex (0, -2); axis x = 0

25) vertex (-6, -5); axis x = -6

26) (-1, 1)

27) $\left(\dfrac{3}{2}, \dfrac{3}{4} \right)$

28) (-2, -3)

29) ∅

30) (7, 5)
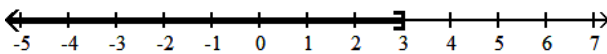
31) 50 ml of 32%; 20 ml of 67%

32) 341 senior citizen tickets
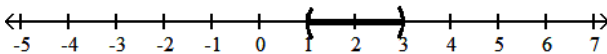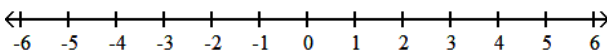
33) 150 pounds of trail mix
    90 pounds of cashews

34) (-∞, 3]

35) (1, 3)

36) ∅
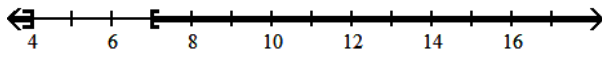
37) $(-\infty, 4] \cup [7, \infty)$

38) $(-\infty, \infty)$