

Summer Math 2022-2023

$$1) \frac{5k^2 - 46k - 40}{2k^2 - 17k - 30} \cdot \frac{5k + 4}{2k + 3} \{10, -1.5\}$$

Simplify each expression.

$$2) \frac{3}{3x} \cdot \frac{x^2 - 15x + 50}{3x - 15} \cdot \frac{x - 10}{3x}$$

$$3) \frac{x - 4}{x + 2} \cdot \frac{x^2 - 2x - 8}{x - 4}$$

$$x - 4$$

$$4) \frac{4r - 16}{r - 10} \div \frac{20r - 80}{10} \cdot \frac{2}{r - 10}$$

$$5) \frac{8}{r^2 - 8r - 20} \div \frac{1}{10 - r} - \frac{8}{r + 2}$$

$$6) \frac{5}{n^2 - 2n - 24} + \frac{3n}{4}$$

$$\frac{20 + 3n^3 - 6n^2 - 72n}{4(n - 6)(n + 4)}$$

$$7) \frac{4r}{r + 2} + \frac{5}{r - 6}$$

$$\frac{4r^2 - 19r + 10}{(r - 6)(r + 2)}$$

$$8) \frac{4}{r - 4} - \frac{6r}{12r + 16}$$

$$\frac{36r + 32 - 3r^2}{2(r - 4)(3r + 4)}$$

$$9) \frac{\frac{m}{m + 1} + \frac{m + 1}{m + 3}}{\frac{m + 3}{m + 1}} \cdot \frac{2m^2 + 5m + 1}{m^2 + 6m + 9}$$

$$10) \frac{\frac{25}{u^2}}{\frac{1}{2} + \frac{u}{2}} \cdot \frac{50}{u^2 + u^3}$$

Solve each equation. Remember to check for extraneous solutions.

$$11) \frac{1}{v - 2} + \frac{v + 6}{v^2 - 2v} = \frac{3}{v - 2}$$

$$\{6\}$$

$$12) \frac{x}{4x^2 - 2x - 12} = \frac{1}{2x + 3} + \frac{1}{4x^2 - 2x - 12}$$

$$\{3\}$$

$$13) \frac{3}{n + 6} = 1 + \frac{1}{n + 6}$$

$$\{-4\}$$

$$14) \frac{4n - 24}{n^2 + n} = \frac{1}{n + 1} + \frac{5}{n^2 + n} \left\{ \frac{29}{3} \right\}$$

$$15) \frac{k^2 - k - 6}{k} = k + 3 + \frac{6}{k}$$

$$\{-3\}$$

Simplify.

$$16) (81k^{12})^{\frac{5}{4}}$$
$$243k^{15}$$

$$17) (n^8)^{\frac{1}{2}}$$
$$n^4$$

Write each expression in radical form.

$$18) (7b)^{\frac{2}{3}}$$
$$(\sqrt[3]{7b})^2$$

$$19) (3x)^{\frac{3}{2}}$$
$$(\sqrt{3x})^3$$

Simplify.

$$20) \frac{5\sqrt{6} + 5\sqrt{5}}{6 - \sqrt{2}} \quad \frac{30\sqrt{6} + 10\sqrt{3} + 30\sqrt{5} + 5\sqrt{10}}{34} \quad 21) \frac{\sqrt{2}}{4\sqrt{6}} \quad \frac{\sqrt{3}}{12}$$

$$22) 7\sqrt[3]{32x^3y^6}$$
$$14xy^2\sqrt[3]{7x^2 \cdot y}$$

Write each expression in exponential form.

$$23) (\sqrt[3]{6n})^5$$
$$(6n)^{\frac{5}{3}}$$

$$24) (\sqrt[6]{m})^5$$
$$m^{\frac{5}{6}}$$

Solve each equation. Remember to check for extraneous solutions.

$$25) 4 = \sqrt{x - 6}$$
$$\{22\}$$

$$26) \sqrt{15 - a} = \sqrt{2a - 12}$$
$$\{9\}$$

$$27) \sqrt{33x - 2} - 10 = -2$$
$$\{2\}$$

Divide.

$$28) (6a^3 - 28a^2 + 20a + 37) \div (a - 3)$$
$$6a^2 - 10a - 10 + \frac{7}{a - 3}$$

$$29) (6p^3 - 42p^2 - 3) \div (p - 7)$$
$$6p^2 - \frac{3}{p - 7}$$

Evaluate each function at the given value.

$$30) f(m) = -4m^4 + 15m^3 + 30m^2 - 27m + 10 \text{ at } m = 5$$
$$0$$

$$31) f(x) = x^3 - 3x^2 - 9x - 12 \text{ at } x = 5$$
$$-7$$

Find all zeros.

32) $f(x) = 9x^3 - 3x^2 - 20x - 6$

$$\left\{ -\frac{1}{3}, \frac{1 + \sqrt{19}}{3}, \frac{1 - \sqrt{19}}{3} \right\}$$

Factor each.

33) $x^3 - 3x^2 - 5x + 15 = 0$

$$(x - 3)(x^2 - 5) = 0$$

34) $x^3 + 125 = 0$

$$(x + 5)(x^2 - 5x + 25) = 0$$

35) $x^2 + 9x + 20 = 0$

$$(x + 4)(x + 5) = 0$$

36) $x^2 - x - 6 = 0$

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

Evaluate each expression.

37) $\log_4 16$

2

38) $\log_4 64$

3

Rewrite each equation in exponential form.

39) $\log_7 \frac{1}{49} = -2$ $7^{-2} = \frac{1}{49}$

40) $\log_7 \frac{1}{343} = -3$ $7^{-3} = \frac{1}{343}$

Rewrite each equation in logarithmic form.

41) $324^{\frac{1}{2}} = 18$ $\log_{324} 18 = \frac{1}{2}$

42) $12^{-2} = \frac{1}{144}$ $\log_{12} \frac{1}{144} = -2$

Solve each equation.

43) $\log(9 - 3x) = \log(x + 1)$

{2}

44) $\log(4n + 4) = \log(4 - 2n)$

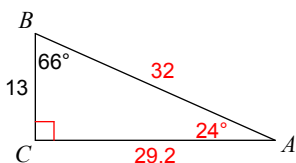
{0}

Find the value of the trig function indicated.

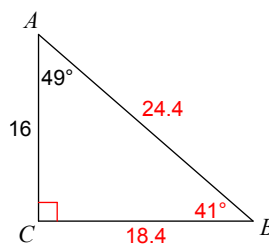
45) Find $\cos \theta$ if $\cot \theta = 3\sqrt{7}$ $\frac{3\sqrt{7}}{8}$

Solve each triangle. Round answers to the nearest tenth.

46)



47)



Use the given point on the terminal side of angle θ to find the value of the trigonometric function indicated.

48) $\sec \theta; (5, -15)$
 $\sqrt{10}$

49) $\cos \theta; (-\sqrt{7}, -3)$ $-\frac{\sqrt{7}}{4}$

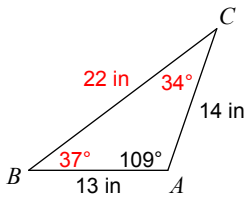
Convert each degree measure into radians and each radian measure into degrees.

50) -580° $-\frac{29\pi}{9}$

51) $-\frac{23\pi}{18}$
 -230°

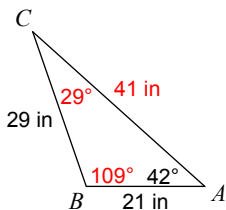
Solve each triangle using laws of cosines. Round your answers to the nearest tenth.

52)



Solve each triangle using law of sines. Round your answers to the nearest tenth.

53)



Simplify.

54) $3\sqrt{15}(\sqrt{10} + \sqrt{2})$
 $15\sqrt{6} + 3\sqrt{30}$

55) $(-5 + \sqrt{5})(3 + 3\sqrt{5})$
 $-12\sqrt{5}$

56) $-\sqrt{27} + 2\sqrt{12} - 3\sqrt{3}$
 $-2\sqrt{3}$

57) $-\sqrt{27} + 2\sqrt{8} - 3\sqrt{8}$
 $-3\sqrt{3} - 2\sqrt{2}$