

Pre-Calculus 11
Final Exam Review #1

Name _____

Date _____

1. What is the common difference in this arithmetic sequence?

$-52, -45, -38, \dots$

- a) -14 b) -7 c) 7 d) 14 e) 45

2. What are the next three terms in this arithmetic sequence?

$36, 29, 22, \dots$

- a) $14, -6, -2$ b) $14, 7, 0$ c) $15, 8, 1$ d) $15, 8, 2$ e) $15, 9, 2$

3. Complete the following arithmetic sequence.

$\square, 6, \square, \square, 19$

- a) $1\frac{1}{2}; 10\frac{1}{2}; 14\frac{2}{3}$ b) $1\frac{2}{3}; 10\frac{1}{3}; 14\frac{2}{3}$ c) $1; 10; 15$ d) $1\frac{3}{4}; 10\frac{1}{2}; 14\frac{3}{4}$ e) $2; 10; 14$

4. Determine the 7th term of the arithmetic sequence.

$25, 19, 13, \dots$

- a) -29 b) -17 c) -11 d) -5 e) 3

5. For the arithmetic sequence $15, 11, 7, 3, \dots$, determine t_n .

- a) $11 - 4n$ b) $11 + 4n$ c) $15 - 4n$ d) $19 - 4n$ e) $19 + 4n$

6. The sequence $14, 8, 2, -4, \dots$ is an arithmetic sequence. Find the formula for t_n and use it to find t_{36} .

- a) -224 b) -220 c) -214 d) -202 e) -196

7. A pile of bricks is arranged in rows. The number of bricks in each row forms the arithmetic sequence $91, 83, 75, \dots$, where row 1 contains 91 bricks, row 2 contains 83 bricks, and so on. Which row contains 19 bricks?

- a) row 8 b) row 9 c) row 10 d) row 11 e) row 12

8. Determine the sum of the arithmetic series.

$12 + 18 + 24 + 30 + 36 + 42$

- a) 120 b) 152 c) 162 d) 172 e) 189

9. Determine the sum of the arithmetic series.

$3 + 6.5 + 10 + \dots + 164$

- a) 3841 b) 3854 c) 3924.5 d) 4008 e) 7849

10. Determine the sum of the first 20 terms in the arithmetic series $8 + 11 + 14 + 17 + \dots$.

- a) 650 b) 665 c) 700 d) 730 e) 760

11. State the common ratio of the geometric sequence.

$$2, -8, 32, \dots$$

- a) -8 b) -4 c) $-\frac{1}{4}$ d) 2 e) 4

12. State the common ratio of the geometric sequence.

$$6, -2, \frac{2}{3}, \dots$$

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

13. What are the next three terms of the geometric sequence?

$$60, -30, 15, \dots$$

- a) $-\frac{15}{2}, \frac{15}{4}, -\frac{15}{8}$ b) $-5, \frac{5}{3}, -\frac{5}{9}$ c) $-5, \frac{5}{2}, -\frac{5}{4}$ d) $5, \frac{5}{3}, \frac{5}{9}$ e) $\frac{15}{2}, \frac{15}{4}, \frac{15}{8}$

14. Complete the following geometric sequence.

$$-1, \square, \square, 64, \square$$

- a) $1; 8; 512$ b) $4; 16; 256$ c) $4; -16; -256$ d) $16; 32; 128$ e) $16; -32; -128$

15. Determine t_6 in the geometric sequence $-2, 6, -18, \dots$

- a) -1458 b) -486 c) -162 d) 486 e) 1458

16. Given the following infinite geometric series:

I. $4 - 12 + 36 - 108 + \dots$

II. $4 - 2 + 1 - \frac{1}{2} + \dots$

III. $1 - \frac{1}{3} + \frac{1}{9} - \frac{1}{27} + \dots$

IV. $18 - 3 + \frac{1}{2} - \frac{1}{12} + \dots$

Which series have a sum?

- a) I only b) II only c) III only d) I and II e) II, III, and IV

17. Determine the sum of the following infinite geometric series:

$$66 + 22 + \frac{22}{3} + \frac{22}{9} + \dots$$

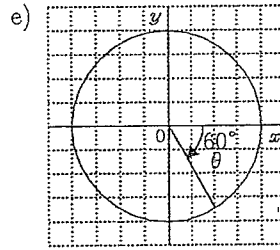
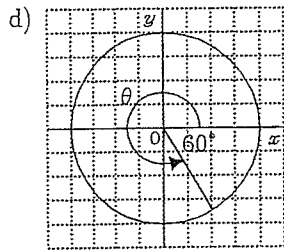
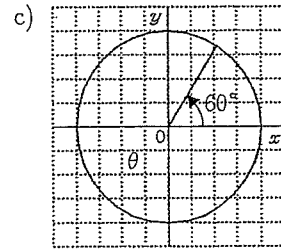
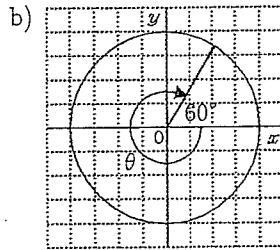
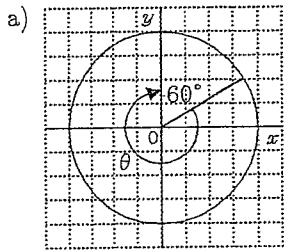
- a) 66 b) 99 c) 198 d) 866 e) 2874

18. Determine the sum of the infinite geometric series:

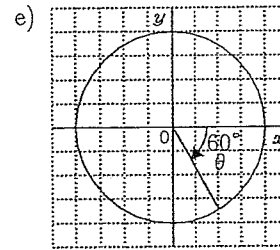
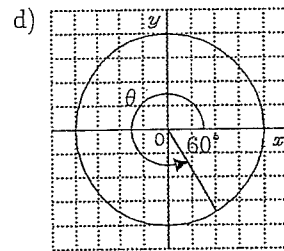
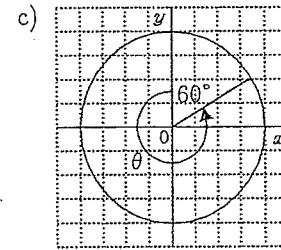
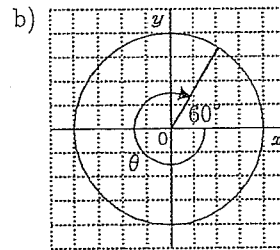
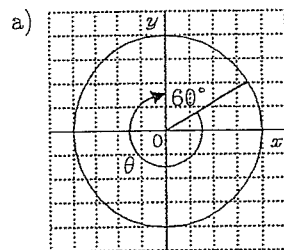
$$39 - 13 + \frac{13}{3} - \frac{13}{9} + \dots$$

- a) 21.75 b) 29.25 c) 33 d) 39 e) 56

19. Which graph shows an angle θ of 60° in standard position?



20. Which graph shows an angle θ of -300° in standard position?



21. P is a point on the terminal arm of an angle θ in standard position. Suppose P has rotated 560° . Where is P located?

a) in quadrant I

b) in quadrant II

c) in quadrant III

d) in quadrant IV

e) on the positive y -axis

22. Determine the exact value of $\tan 240^\circ$.

a) $-\frac{\sqrt{3}}{2}$

b) $\frac{\sqrt{3}}{2}$

c) $\sqrt{3}$

d) $-\sqrt{3}$

e) 1.732

23. Determine the exact value of $\tan 135^\circ$.

a) -1

b) $\frac{\sqrt{3}}{3}$

c) 1

d) $-\sqrt{3}$

e) $\sqrt{3}$

24. The angle θ is in the third quadrant and $\tan \theta = \frac{4}{5}$. Point P is on the terminal arm of angle θ .

Which is a possible coordinate for P?

- a) $(-4, 10)$ b) $(4, 5)$ c) $(10, 8)$ d) $(-10, -8)$ e) $(10, -8)$

25. The angle θ is in the second quadrant and $\tan \theta = -\frac{3}{2}$. Point P is on the terminal arm of angle θ .

A possible coordinate for P is _____.

- a) $(6, -4)$ b) $(4, 6)$ c) $(-6, 4)$ d) $(-4, 6)$ e) $(-3, 2)$

26. Determine the exact value of $\sin 120^\circ$

- a) -0.8660 b) $-\frac{\sqrt{3}}{2}$ c) $\frac{2}{\sqrt{3}}$ d) $\frac{\sqrt{3}}{2}$ e) $\frac{\sqrt{2}}{2}$

27. Determine the exact value of $\sin 30^\circ$

- a) $\frac{\sqrt{2}}{2}$ b) $\sqrt{2}$ c) $\frac{1}{2}$ d) $-\frac{\sqrt{2}}{2}$ e) $\frac{\sqrt{3}}{2}$

28. Determine the exact value of $\cos 135^\circ$

- a) -1 b) $\frac{1}{2}$ c) $\frac{\sqrt{3}}{2}$ d) $-\frac{\sqrt{2}}{2}$ e) $\frac{\sqrt{2}}{2}$

29. Determine the exact value of $\cos 240^\circ$

- a) $\frac{1}{2}$ b) $-\frac{1}{2}$ c) $\frac{\sqrt{2}}{2}$ d) $-\frac{\sqrt{3}}{2}$ e) $-\frac{\sqrt{3}}{2}$

30. The angle θ is in the first quadrant and $\sin \theta = \frac{3}{\sqrt{34}}$.

Determine possible coordinates for point P on the terminal arm of θ .

- a) $(5, \sqrt{34})$ b) $(3, \sqrt{34})$ c) $(3, 5)$ d) $(34, 3)$ e) $(5, 3)$

31. The angle θ is in the second quadrant and $\cos \theta = -\frac{3}{\sqrt{13}}$.

Determine possible coordinates for point P on the terminal arm of θ .

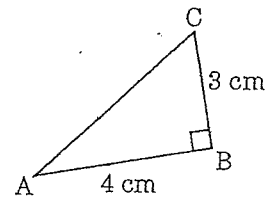
- a) $(2, -3)$ b) $(2, 3)$ c) $(3, -2)$ d) $(-3, 2)$ e) $(-3, 13)$

32. How many solutions are there for $\sin x = \frac{\sqrt{2}}{2}$, where $0 \leq x \leq 2\pi$?

- a) 2 b) 3 c) 4 d) 6 e) 12

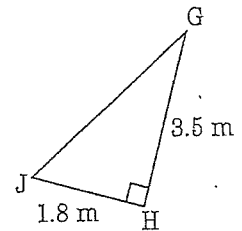
33. In the triangle, calculate $\tan A$.

- a) $-\frac{3}{4}$ b) $\frac{2}{5}$ c) $\frac{3}{5}$ d) $\frac{3}{4}$ e) $\frac{4}{3}$



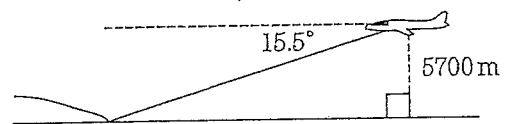
34. In the triangle, determine $\angle J$ to the nearest degree.

- a) 27° b) 31° c) 53° d) 59° e) 63°



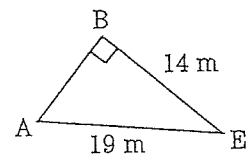
35. An Air Canada commuter jet is flying at an altitude of 5700 m over the Great Lakes. At a certain time, the angle of depression to the shoreline from the jet is 15.5° . How much farther does the jet have to fly before it reaches the shoreline? Make your answer correct to the nearest metre.

- a) 1581 m b) 5493 m c) 5915 m
d) 20554 m e) 21329 m



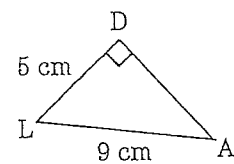
36. In the triangle shown, calculate $\sin A$.

- a) $\frac{14}{19}$ b) $\frac{19}{14}$ c) $\frac{\sqrt{165}}{19}$ d) $\frac{\sqrt{165}}{14}$ e) $\frac{14}{\sqrt{165}}$



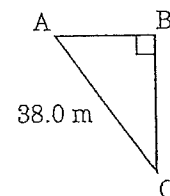
37. In the triangle shown, determine $\angle A$ to the nearest degree.

- a) 29° b) 34° c) 46° d) 56° e) 61°



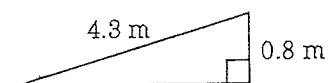
38. In $\triangle ABC$, calculate $\angle A$ to the nearest degree given that $AB = 18.0$ cm.

- a) 25° b) 28° c) 58° d) 62° e) 65°



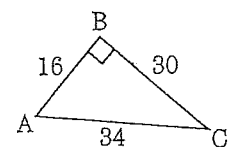
39. A boat launching ramp is 4.3 m long. It rises 0.8 m. What is its angle of inclination to the nearest tenth of a degree?

- a) 10.5° b) 10.7° c) 11.5° d) 79.3° e) 79.5°



40. For $\triangle ABC$, determine $\cos C$.

- a) $\frac{8}{17}$ b) $\frac{15}{17}$ c) $\frac{17}{15}$ d) $\frac{15}{8}$ e) $\frac{17}{8}$



41. Solve $\triangle XYZ$, given $\angle Y = 90^\circ$, $YZ = 38$, and $\angle X = 66^\circ$. Make your angle measures correct to the nearest degree and side measures to 1 decimal place.

a) $\angle Z = 24^\circ$, $XY = 16.9$, $XZ = 41.6$

b) $\angle Z = 24^\circ$, $XY = 16.9$, $XZ = 93.4$

c) $\angle Z = 24^\circ$, $XY = 41.6$, $XZ = 16.9$

d) $\angle Z = 24^\circ$, $XY = 84.3$, $XZ = 93.4$

e) $\angle Z = 34^\circ$, $XY = 16.9$, $XZ = 41.6$

42. Lynn is climbing a sheer cliff. Paula is standing 8.0 m from the base of the cliff and is belaying Lynn with a rope connected to a bolt on the cliff (see diagram). The angle of inclination of the rope is 36° . The angle of elevation from Paula to the top of the cliff is 53° . Calculate the height of the cliff to the nearest tenth of a metre.

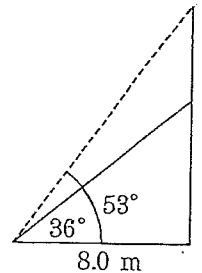
a) 5.6 m

b) 10.6 m

c) 11.4 m

d) 16.6 m

e) 17.2 m



43. Determine the cosine of an angle measuring 90° .

a) -1

b) -0.448

c) 0

d) 0.894

e) 1

44. Determine the approximate value of the sine of an angle measuring 163° .

a) -0.355

b) -0.292

c) 0.292

d) 0.935

e) 0.956

45. Which of the following values is positive?

a) $\cos 136^\circ$

b) $\cos 91^\circ$

c) $\sin 127^\circ$

d) $\cos 154^\circ$

e) $\cos 180^\circ$

46. Which of the following values is negative?

a) $\sin 67^\circ$

b) $\cos 67^\circ$

c) $\sin 90^\circ$

d) $\sin 93^\circ$

e) $\cos 93^\circ$

47. Given that $0^\circ \leq \angle C \leq 180^\circ$, determine the value(s) of $\angle C$ to the nearest degree when $\sin C = 0.3090$.

a) $18^\circ, 72^\circ$

b) $18^\circ, 162^\circ$

c) 18°

d) 72°

e) 162°

48. Calculate to two decimal places the length of side BC.

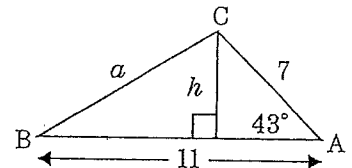
a) 6.04

b) 7.00

c) 7.57

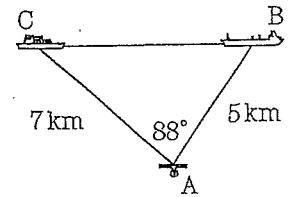
d) 8.49

e) 12.06



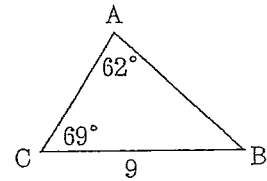
49. The diagram shows a radar station at A tracking ships at B and C. How far apart to the nearest hundredth of a kilometre are the two ships?

- a) 4.76 km b) 5.13 km c) 7.00 km d) 8.46 km e) 8.60 km



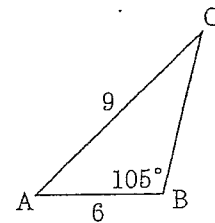
50. Calculate the length of AB in $\triangle CAB$ to 1 decimal place.

- a) 6.9 b) 8.5 c) 9.5 d) 10.2 e) 11.8



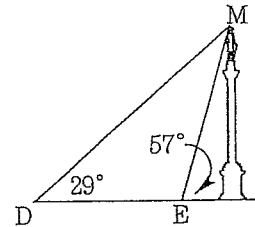
51. Calculate the measure of $\angle C$ in $\triangle BCA$ to the nearest tenth of a degree.

- a) 9.9° b) 40.1° c) 41.8° d) 44.6° e) 49.9°



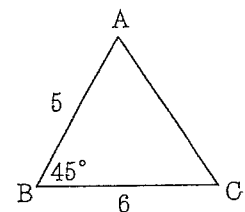
52. In the diagram points D and E have lines of sight to the top of a monument at M which make angles of 29° and 57° , respectively, with DE. The length of DE is 56.0 m. Calculate the height of the monument to the nearest tenth of a metre.

- a) 20.2 m b) 27.5 m c) 31.5 m d) 41.2 m e) 48.5 m



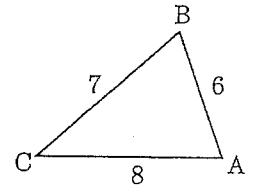
53. Calculate the length of AC in $\triangle BAC$ to 1 decimal place.

- a) 4.3 b) 6.3 c) 8.6 d) 10.2 e) 18.6



54. Calculate the measure of $\angle A$ in $\triangle CBA$ to the nearest tenth of a degree.

- a) 32.1° b) 43.4° c) 46.6° d) 57.9° e) 75.5°

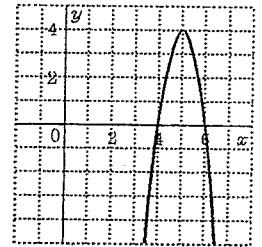


55. Which of the following functions is *not* quadratic?

- a) $y = 3(x - 1)^2 + 5$ b) $y = x^2$ c) $f(x) = 3x + 5$
 d) $f(x) = x(x + 1)$ e) $y = \frac{1}{2}x^2 + 5$

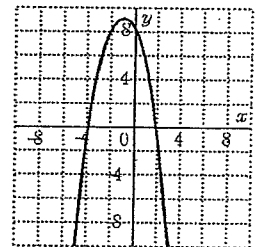
56. What is the equation of the axis of symmetry?

- a) $y = 4$ b) $x = 5$ c) $x + y = 9$ d) $y = 5$ e) $x = 4$



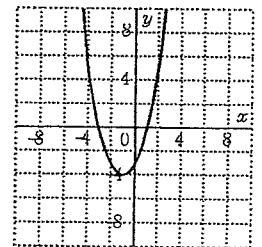
57. What are the x - and y -intercepts?

- a) x -int: -1 ; y -int: 9 b) x -int: $-4, 2$; y -int: 0
 c) x -int: $-4, 2$; y -int: 8 d) x -int: -1 ; y -int: $-4, 2$
 e) x -int: -1 ; y -int: 0



58. What are the domain and range of the function?

- a) D: $-3 \leq x \leq 1$; R: all real numbers
 b) D: $x \leq -3$ and $x > 1$; R: $y \geq -4$
 c) D: all real numbers; R: $y \geq -4$
 d) D: all real numbers; R: all real numbers
 e) D: $x \geq -1$; R: $y \geq -4$



59. Which equation has a y -intercept of 13?

- a) $y = 13x^2 + x$ b) $y = (x - 13)^2 + 1$ c) $y = (x - 3)^2 + 13$
 d) $y = 2(x + 3)^2 - 5$ e) $y = 2x^2 + 12x + 11$

60. By graphing the quadratic function $f(x) = x^2 - 2x + 4$, find the equation of its axis of symmetry.

- a) $x = 3$ b) $x = 1$ c) $x = -1$ d) $x = 4$ e) $x = -3$

61. By graphing the quadratic function $f(x) = -x^2 - 6x - 5$, find the domain and the range.

- a) D: all real numbers; R: all real numbers b) D: $-5 \leq x \leq -1$; R: all real numbers
 c) D: all real numbers; R: $y \geq 4$ d) D: all real numbers; R: $y \leq 4$
 e) D: $x \leq -3$; R: $y \leq 4$

62. Solve $2t^2 - 7t - 4 = 0$.

- a) $t = -1$ or 4 b) $t = \frac{1}{2}$ or -4 c) $t = -\frac{1}{2}$ or -4 d) $t = 1$ or -4 e) $t = -\frac{1}{2}$ or 4

63. What is the equation of a quadratic function that has zeros 3 and 4?

- a) $f(x) = x^2 - x + 12$ b) $f(x) = x^2 + x + 12$ c) $f(x) = x^2 + 7x + 12$
 d) $f(x) = x^2 + 7x - 12$ e) $f(x) = x^2 - 7x + 12$

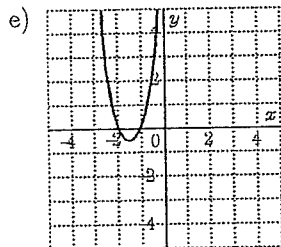
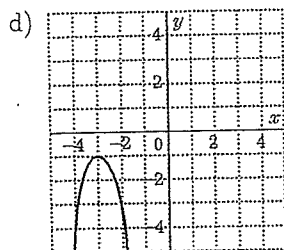
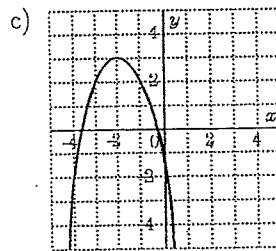
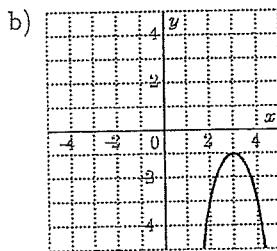
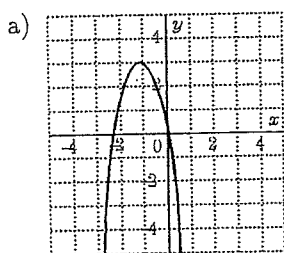
64. The parabola $y = x^2$ is changed to the form $y = a(x - p)^2 + q$ by translating the parabola 2 units up and 4 units right and expanding it vertically by a factor of 3. What are the values of a , p , and q ?

- a) $a = 3, p = 4, q = 2$ b) $a = 4, p = 2, q = 3$ c) $a = 2, p = 3, q = 4$
 d) $a = 2, p = 4, q = 3$ e) $a = 2, p = -4, q = 3$

65. How does the graph of a quadratic function in the form $y = a(x - p)^2 + q$ change when the value of p is decreased by 3, the value of q is increased by 2, and the sign of a is changed to its opposite?

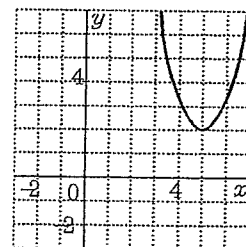
- a) the graph is reflected in the x -axis, and translated 2 units right and 3 units up.
 b) the graph is reflected in the x -axis, and translated 2 units right and 3 units down.
 c) the graph is reflected in the y -axis, and translated 2 units right and 3 units down.
 d) the graph is reflected in the x -axis, and translated 3 units left and 2 units up.
 e) the graph is reflected in the x -axis, and translated 3 units right and 2 units up.

66. Which of the following represents the graph of $y = -2(x - 3)^2 - 1$?

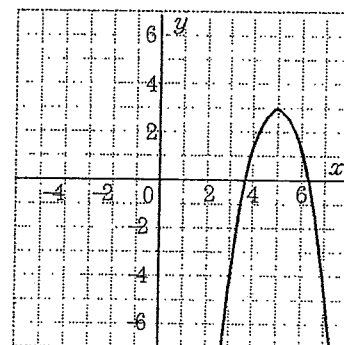


67. What are the coordinates of the vertex of the parabola $y = \frac{1}{3}(x+4)^2 + 6$?
- a) (4, 6) b) (-4, 6) c) (-4, -6) d) (4, -6) e) $(\frac{1}{3}, -4)$
68. What is the equation of the axis of symmetry for the parabola $y = \frac{2}{3}(x-2)^2 - 5$?
- a) $x = \frac{2}{3}$ b) $x = -2$ c) $x = 2$ d) $x = 5$ e) $x = -5$
69. What is the y -intercept of the parabola $y = \frac{1}{3}(x-3)^2 + 3$?
- a) 3 b) 0 c) -3 d) 9 e) 6
70. What is the equation of the parabola with vertex (3, 4), that opens up, and is congruent to $y = -\frac{1}{4}x^2$?
- a) $y = -\frac{1}{4}(x-3)^2 + 4$ b) $y = -\frac{1}{4}(x+3)^2 + 4$ c) $y = \frac{1}{4}(x+3)^2 + 4$
d) $y = -\frac{1}{4}(x+3)^2 - 4$ e) $y = \frac{1}{4}(x-3)^2 + 4$
71. What is the equation of the parabola with vertex (1, 3) and passing through (3, 5)?
- a) $y = (x+1)^2 + 3$ b) $y = -\frac{1}{2}(x+1)^2 + 3$ c) $y = \frac{1}{2}(x-1)^2 + 3$
d) $y = 2(x-1)^2 - 3$ e) $y = (x+1)^2 + 3$
72. What is the equation of the given quadratic function?

- a) $y = 2(x+5)^2 + 2$ b) $y = 2(x-5)^2 + 2$ c) $y = -2(x-5)^2 + 2$
d) $y = -2(x+5)^2 + 2$ e) $y = -2(x+5)^2 - 2$



73. What does the quadratic equation $f(x) = x^2 - 6x + 8$ look like when it is rewritten in the form $f(x) = a(x-p)^2 + q$?
- a) $f(x) = (x-3)^2 + 17$ b) $f(x) = (x-3)^2 - 1$ c) $f(x) = (x-3)^2 + 5$
d) $f(x) = (x-6)^2 - 28$ e) $f(x) = (x+6)^2 - 28$
74. In the diagram shown, is the vertex a maximum or minimum point? What are the coordinates of the vertex?
- a) minimum; (5, 3) b) maximum; (5, 3) c) minimum; (-3, 5)
d) maximum; (5, -3) e) minimum; (5, -3)



75. What does the quadratic equation $y = 2x^2 + 16x + 26$ look like when it is rewritten in the form $y = a(x - p)^2 + q$?

a) $y = 2(x + 4)^2 - 3$

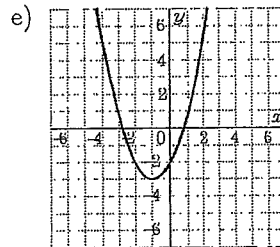
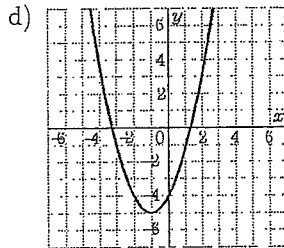
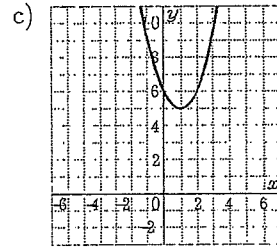
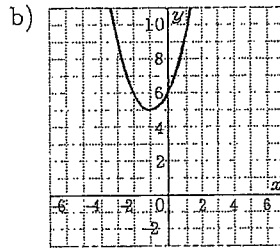
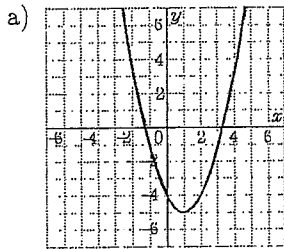
b) $y = 2(x + 4)^2 + 42$

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

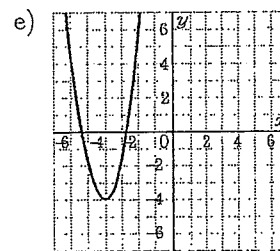
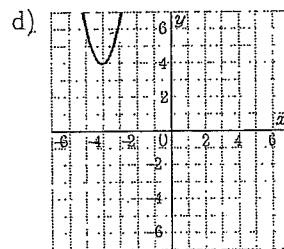
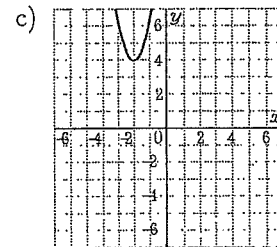
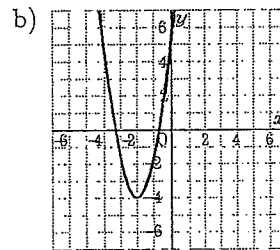
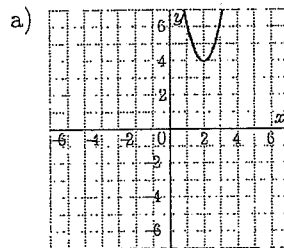
d) $y = 2(x + 8)^2 - 19$

e) $y = 2(x + 8)^2 + 10$

76. Which of the following represents the graph of $y = x^2 + 2x - 4$?



77. Which of the following represents the graph of $f(t) = 3t^2 + 12t + 8$?



78. Does the parabola $y = 2(x + 4)^2 + 1$ contain a maximum or minimum point; what is the maximum or minimum value of y ?

a) minimum point; 4

b) maximum point; 4

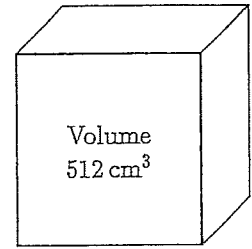
c) minimum point; -4

d) maximum point; 1

e) minimum point; 1

90. Given the volume of the cube, determine the area of a face.

- a) 8 cm^2 b) 36 cm^2 c) 64 cm^2 d) 216 cm^2 e) 384 cm^2



91. Simplify: $\sqrt{1 + 16 + 64}$

- a) -13 b) -9 c) 9 d) 13 e) $\sqrt[3]{81}$

92. Simplify: $\sqrt{\sqrt[3]{4096}}$

- a) -8 b) -4 c) 2 d) 4 e) 8

93. Determine the exact value of $27^{\frac{1}{3}}$.

- a) 1 b) 3 c) 9 d) 81
e) 19683

94. Determine the exact value of $25^{\frac{3}{2}}$.

- a) $\sqrt[3]{5}$ b) 8.550 c) 37.5 d) 62.5 e) 125

95. Write $c^{\frac{4}{3}} \div c^{\frac{1}{3}}$ as a power.

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

96. Write $(\sqrt[4]{x^3})(\sqrt[3]{x^4})$ as a power.

- a) $x^{-\frac{7}{12}}$ b) x c) $x^{\frac{7}{12}}$ d) $x^{\frac{12}{7}}$ e) $x^{\frac{25}{12}}$

97. Write $(\sqrt[4]{y^5})(\sqrt[3]{y^2})$ as a power.

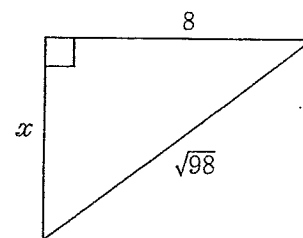
- a) $y^{\frac{6}{15}}$ b) y c) $y^{\frac{22}{15}}$ d) $y^{\frac{23}{12}}$ e) $y^{\frac{23}{10}}$

98. Simplify $(\sqrt[2]{x^3y^5})^4$

- a) $x^{\frac{3}{2}}y^{\frac{5}{2}}$ b) $x^{\frac{81}{16}}y^{\frac{625}{16}}$ c) x^6y^{10} d) $x^{12}y^{20}$ e) y^6x^{10}

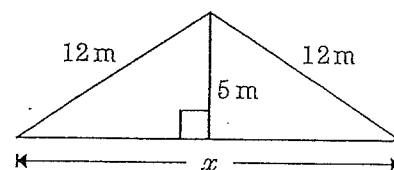
99. Use the Pythagorean Theorem to calculate the value of x to 1 decimal place.

- a) 5.8 b) 8.6 c) 9.5 d) 10.3 e) 12.7



100. Calculate the length, x , to the nearest hundredth of a metre.

- a) 10.91 m b) 11.79 m c) 21.82 m d) 23.58 m e) 26.00 m



101. Express $\sqrt{198}$ as a mixed radical in simplest form.

- a) $3\sqrt{2}$ b) $6\sqrt{2}$ c) $3\sqrt{22}$ d) $22\sqrt{3}$ e) 99

102. Multiply: $7\sqrt{6} \times \sqrt{5}$

- a) $\sqrt{210}$ b) $7\sqrt{11}$ c) $7\sqrt{30}$ d) $35\sqrt{6}$ e) 210

103. Multiply: $5\sqrt{24} \times \sqrt{48}$

- a) $10\sqrt{24}$ b) $40\sqrt{6}$ c) $50\sqrt{6}$ d) $30\sqrt{2}$ e) $120\sqrt{2}$

104. Multiply: $(-4\sqrt{12})(-7\sqrt{10})$

- a) $-3\sqrt{7} - 18$ b) $4\sqrt{210}$ c) $3\sqrt{462}$ d) $56\sqrt{30}$ e) $126\sqrt{11}$

105. Multiply: $-3\sqrt{8} \times 5\sqrt{12}$

- a) $-30\sqrt{5}$ b) $-540\sqrt{6}$ c) $-12\sqrt{10}$ d) $-50\sqrt{3}$ e) $-60\sqrt{6}$

106. Multiply and simplify: $6\sqrt{\frac{5}{8}} \times -2\sqrt{\frac{28}{55}}$

- a) $-\sqrt{\frac{7}{22}}$ b) $-12\sqrt{\frac{499}{440}}$ c) $-12\sqrt{\frac{7}{22}}$ d) $-6\sqrt{\frac{35}{110}}$ e) $-\frac{6\sqrt{154}}{11}$

107. Multiply and simplify: $-13\sqrt{\frac{14}{27}} \times 2\sqrt{\frac{63}{56}}$

- a) $-\frac{13\sqrt{84}}{6}$ b) $-26\sqrt{\frac{49}{84}}$ c) $-\frac{13\sqrt{21}}{3}$ d) $-26\sqrt{\frac{2485}{1512}}$ e) $-\sqrt{\frac{7}{12}}$

108. Arrange in order from least to greatest:

$$\sqrt{68}, 6\sqrt{2}, 3\sqrt{7}, \frac{5}{2}\sqrt{10}, 2\sqrt{15}$$

- a) $6\sqrt{2}, \sqrt{68}, 3\sqrt{7}, \frac{5}{2}\sqrt{10}, 2\sqrt{15}$ b) $2\sqrt{15}, 3\sqrt{7}, \frac{5}{2}\sqrt{10}, \sqrt{68}, 6\sqrt{2}$ c) $\frac{5}{2}\sqrt{10}, 2\sqrt{15}, 3\sqrt{7}, \sqrt{68}, 6\sqrt{2}$
 d) $2\sqrt{15}, \frac{5}{2}\sqrt{10}, 3\sqrt{7}, \sqrt{68}, 6\sqrt{2}$ e) $2\sqrt{15}, 3\sqrt{7}, \sqrt{68}, \frac{5}{2}\sqrt{10}, 6\sqrt{2}$

109. Express $\sqrt[3]{72}$ as a mixed radical in simplest form.

- a) $2\sqrt[3]{3}$ b) $2\sqrt[3]{6}$ c) $2\sqrt[3]{9}$ d) $3\sqrt[3]{2}$ e) $18\sqrt[3]{2}$

110. Multiply: $\sqrt[3]{9} \times \sqrt[3]{36}$

- a) $\sqrt[3]{45}$ b) $3\sqrt[3]{4}$ c) $12\sqrt[3]{3}$ d) $3\sqrt[3]{12}$ e) $6\sqrt[3]{12}$

111. Simplify: $\frac{\sqrt{40}}{\sqrt{5}}$

- a) 3 b) $2\sqrt{2}$ c) $\sqrt{7}$ d) $\sqrt{35}$ e) $\sqrt{200}$

112. Simplify: $\frac{\sqrt{8}}{4\sqrt{72}}$

- a) $\frac{1}{\sqrt{72}}$ b) $\frac{1}{12}$ c) $\frac{1}{6}$ d) $\frac{1}{3}$ e) $\frac{1}{8\sqrt{2}}$

113. Simplify: $\frac{15\sqrt{17}}{5\sqrt{34}}$

- a) $\frac{\sqrt{2}}{3}$ b) $\frac{\sqrt{2}}{2}$ c) $\sqrt{2}$ d) $\frac{3\sqrt{2}}{2}$ e) $3\sqrt{2}$

114. Determine an equivalent form: $\frac{2\sqrt{63}}{3\sqrt{14}}$

- a) $\frac{\sqrt{18}}{3}$ b) $\sqrt{2}$ c) $\sqrt{3}$ d) $2\sqrt{2}$ e) 3

115. Simplify: $14\sqrt{11} + 5\sqrt{11}$

- a) $9\sqrt{11}$ b) $19\sqrt{11}$ c) $19\sqrt{22}$ d) $\sqrt{209}$ e) 209

116. Simplify: $7\sqrt{6} + 15\sqrt{6} - 27\sqrt{6}$

- a) $-5\sqrt{6}$ b) $5\sqrt{6}$ c) $49\sqrt{6}$ d) $-5\sqrt{18}$ e) $\sqrt{294}$

117. Determine an equivalent form for $\sqrt{147} + \sqrt{243}$.

- a) $\sqrt{390}$ b) $6\sqrt{16}$ c) 24 d) $16\sqrt{3}$ e) $16\sqrt{6}$

118. Determine an equivalent form for $\sqrt{45} - \sqrt{180}$.

- a) -3 b) $-\sqrt{135}$ c) $-3\sqrt{15}$ d) $-3\sqrt{5}$ e) $3\sqrt{5}$

119. Simplify: $2\sqrt{18} - 6\sqrt{45} + 4\sqrt{72} + 2\sqrt{80}$

- a) $-18\sqrt{2} - 10\sqrt{5}$ b) $30\sqrt{2} - 10\sqrt{5}$ c) $30\sqrt{2} + 26\sqrt{5}$ d) $2\sqrt{125}$ e) 10

120. Simplify: $5\sqrt{63} - 3\sqrt{180} + 6\sqrt{28} + 2\sqrt{245}$

- a) $-9\sqrt{7} - 4\sqrt{5}$ b) $10\sqrt{156}$ c) $27\sqrt{7} - 4\sqrt{5}$ d) $39\sqrt{7} + 32\sqrt{5}$ e) 253

121. Determine the exact value of $4\sqrt[3]{189} + 3\sqrt[3]{56}$.

- a) $5\sqrt[3]{7}$ b) $6\sqrt[3]{7}$ c) $18\sqrt[3]{7}$ d) $18\sqrt[3]{14}$ e) $7\sqrt[3]{245}$

122. Determine an equivalent form for $\sqrt{7}(\sqrt{2} - \sqrt{5})$.

- a) -21 b) $-\sqrt{21}$ c) $3 - \sqrt{12}$ d) $\sqrt{14} - \sqrt{5}$ e) $\sqrt{14} - \sqrt{35}$

123. Expand and simplify: $2\sqrt{6}(3\sqrt{2} - 4\sqrt{6})$

- a) $-36\sqrt{3}$ b) $\sqrt{3} - 4$ c) $10\sqrt{2} - 2$ d) $12\sqrt{3} - 48$ e) $12\sqrt{3} - 4\sqrt{6}$

124. Simplify: $(\sqrt{2} - 5)(\sqrt{2} - 7)$

- a) $35 - 12\sqrt{2}$ b) $37 - \sqrt{14} - \sqrt{10}$ c) $37 - 12\sqrt{2}$ d) $39 - 12\sqrt{2}$ e) $70 - 35\sqrt{2}$

125. Simplify: $(\sqrt{12} + 6)(\sqrt{3} + 2)$

- a) $12 + 10\sqrt{3}$ b) $18 + 10\sqrt{3}$ c) $18 + \sqrt{24} + \sqrt{18}$ d) $44 + 10\sqrt{3}$ e) $72 + 24\sqrt{3}$

126. Simplify: $(7 - 3\sqrt{2})^2$

- a) $31 - 42\sqrt{2}$ b) $31 - 21\sqrt{2}$ c) $49 - 33\sqrt{2}$ d) $67 - 21\sqrt{2}$ e) $67 - 42\sqrt{2}$

127. Simplify: $(3\sqrt{5} + 2\sqrt{3})(3\sqrt{5} - 2\sqrt{3})$

- a) 33 b) $45 - 4\sqrt{3}$ c) $3\sqrt{5} - 12$ d) $9\sqrt{5} - 4\sqrt{3}$ e) $6\sqrt{10} - 4\sqrt{6}$

128. Simplify: $(2\sqrt{3} + \sqrt{5})(3\sqrt{7} - 2\sqrt{5})$

- a) $6\sqrt{21} - 4\sqrt{15} - 3\sqrt{35} - 10$ b) $6\sqrt{21} - 4\sqrt{15} + 3\sqrt{35} - 10$ c) $6\sqrt{21} - 4\sqrt{15} + 3\sqrt{35} - 2\sqrt{5}$
 d) $6\sqrt{21} - 4\sqrt{15} + 3\sqrt{35} + 10$ e) $6\sqrt{21} + 4\sqrt{15} + 3\sqrt{35} - 10$

129. Rationalize the denominator: $\frac{5\sqrt{3}}{2\sqrt{7}}$

- a) $\frac{5\sqrt{3}}{14}$ b) $\frac{5\sqrt{10}}{14}$ c) $\frac{5\sqrt{21}}{14}$ d) $\frac{5\sqrt{21}}{28}$ e) $\frac{15}{2\sqrt{21}}$

130. Rationalize the denominator: $\frac{5\sqrt{2}}{12\sqrt{5}}$

- a) $\frac{\sqrt{10}}{720}$ b) $\frac{\sqrt{10}}{12}$ c) $\frac{5\sqrt{7}}{12}$ d) $\frac{5\sqrt{2}}{12}$ e) $\frac{5}{6\sqrt{10}}$

131. Rationalize the denominator: $\frac{15\sqrt{7} - 6\sqrt{6}}{5\sqrt{3}}$

- a) $\frac{5\sqrt{21} - 6\sqrt{2}}{15}$ b) $\frac{5\sqrt{21} - 6\sqrt{2}}{5}$ c) $\frac{15\sqrt{21} - 18\sqrt{2}}{5}$ d) $\frac{15\sqrt{21} - 6\sqrt{2}}{5}$ e) $\sqrt{21} - 6\sqrt{2}$

132. Rationalize the denominator: $\frac{7}{4 - \sqrt{3}}$

- a) $\frac{7}{13}$ b) $\frac{28 - 7\sqrt{3}}{13}$ c) $\frac{28 + 7\sqrt{3}}{13}$ d) $28 - 7\sqrt{3}$ e) $28 + 7\sqrt{3}$

133. Rationalize the denominator: $\frac{5\sqrt{3} - 3\sqrt{5}}{2\sqrt{5} - 3\sqrt{3}}$

a) $-\frac{15 + \sqrt{15}}{7}$

b) $\frac{15 + \sqrt{5}}{47}$

c) $\frac{15 + \sqrt{5}}{7}$

d) $\frac{75 - 19\sqrt{15}}{7}$

e) $\frac{75 + 19\sqrt{15}}{7}$

134. Simplify: $(-16b^2)(-32b^4)$

a) $2b^2$

b) $0.5b^2$

c) $512b$

d) $512b^6$

e) $-512b^6$

135. Simplify: $(45b^2)(2b^4)$

a) $90b^8$

b) $90b^6$

c) $45b^2$

d) $45b^8$

e) $22.5b^2$

136. Simplify: $(16q^6)(-4q^3)(-2q)$

a) $128q^{10}$

b) $-128q^{10}$

c) $128q^{18}$

d) $10q^{10}$

e) $2q^{19}$

137. Simplify: $(-6st^2)(-7st)$

a) $42s^2t^3$

b) $42s^3t^2$

c) $-42s^2t^3$

d) $-13s^2t^3$

e) $13s^2t^3$

138. Simplify: $-(5a^7b^3)(6a^2)^4$

a) $-11a^{15}b^3$

b) $-30a^{15}b^3$

c) $-6480a^{15}b^3$

d) $30a^{15}b^3$

e) $120a^{15}b^3$

139. Simplify: $\frac{21x^6}{3x^2}$

a) $7x^4$

b) $7x^{12}$

c) $7x^{14}$

d) $7x^{21}$

e) $7x^{36}$

140. Simplify: $\frac{(6m^5n^7)(7m^4n^3)}{2mn}$

a) $21m^{19}n^{20}$

b) $21n^9$

c) $21m^8n^9$

d) $6.5m^8n^9$

e) $21m^9n^8$

141. Simplify: $\frac{(21m^4n^7)(16m^8n^9)}{3m^5n^{12}}$

a) $112m^4n^7$

b) $34m^5n^4$

c) $112m^{27}n^{51}$

d) $112m^7n^4$

e) $112m^5n^2$

142. Simplify: $\frac{(-9p^2q^2)(-8q^2)^3}{2pq}$

a) $2304pq^7$

b) $-2304p^7q$

c) $36pq^7$

d) $-2304pq^7$

e) $-108pq^7$

143. Simplify: $(5x + 17) - (2x + 4)$

a) $-10x - 68$

b) $3x + 68$

c) $3x + 13$

d) $10x - 21$

e) $3x + 21$

144. Simplify: $(x^2 - 4x + 4y) + (11x^2 + 4x - 15y)$

a) $12x^2 - 8x - 11y$

b) $12x^2 - 11y$

c) $10x^2 - 8x - 19y$

d) $12x^2 - 8x + 19y$

e) $10x^2 + 19y$

145. Simplify: $(x^2 - 2x + 3) - (4x^2 - 5x + 6) - (7x^2 + 8x - 9)$

a) $10x^2 - 5x + 6$

b) $4x^2 - 5x + 6$

c) $4x^2 - 5x + 6$

d) $-10x^2 - 5x + 6$

e) $-10x^2 - 5x$

146. Add: $5z^3 - 5z^2 + 7z - 4$
 $\underline{2z^3 + 5z^2 - 7z - 3}$

a) $7z^3 - 10z^2 - 7$ b) $-7z^3 - 7$ c) $3z^3 - 7$ d) $7z^3 - 10z + 1$ e) $7z^3 - 7$

147. Expand then simplify: $-4(x - 6) + 2$

a) $-4x + 26$ b) $4x - 26$ c) $-4x - 26$ d) $-4x - 4$ e) $-4x - 20$

148. Expand then simplify: $7(x + 5) - 5(x + 8)$

a) $-2x - 5$ b) $7x + 43$ c) $2x - 5$ d) $-2x + 75$ e) $-2x - 75$

149. Factor: $2m + 12$

a) $2(m + 12)$ b) $2(m - 6)$ c) $12(m + 1)$ d) $-2(m - 1)$ e) $2(m + 6)$

150. Factor: $25x + 10x^2$

a) $5x(5 - 2x)$ b) $25(x + 5x^2)$ c) $10x(x + 25)$ d) $10x(25 - x)$ e) $5x(5 + 2x)$

151. Factor: $4x^2 + 8x + 8$

a) $2(x^2 + 4x + 4)$ b) $4(x^2 + 4x + 4)$ c) $2(x^2 + 2x + 2)$ d) $4(x^2 + 2x + 2)$ e) $4(x + 4)(x - 1)$

152. Factor: $-44xy^2 - 11x^2y$

a) $-11xy(4y - x)$ b) $11xy(y + 4x)$ c) $-4xy(11y - 11x)$
d) $-11xy(4y + x)$ e) $-2xy(22y + 11x)$

153. Expand then simplify: $2(5x - 7y) - 24x$

a) $14x - 14y$ b) $-14x + 14y$ c) $14x - 7y$ d) $-14x - 14y$ e) $7x - 14y$

154. Factor: $12h^2 + 13h + 3$

a) $(4h - 3)(3h - 1)$ b) $2(1 - h)(6h - 1)$ c) $(3h + 1)(4h + 3)$ d) $(3h - 3)(4h - 1)$ e) $(6h + 1)(2h + 3)$

155. Factor: $4t^2 + 5t - 6$

a) $(4t - 3)(t - 2)$ b) $(2t - 3)(2t + 2)$ c) $2(2t - 3)(t + 1)$ d) $(4t + 3)(t - 2)$ e) $(4t - 3)(t + 2)$

156. Factor: $8x^2 - 13x - 6$

a) $(8x + 3)(x - 2)$ b) $(2x + 3)(4x - 2)$ c) $4(2x - 1)(x + 2)$ d) $(x - 3)(8x - 2)$ e) $2(x - 3)(4x - 1)$

157. Factor: $x^2 - 25$

a) $(x - 5)(x - 5)$ b) $(x + 5)(x - 5)$ c) $(x + 5)(x + 5)$ d) $(x + 25)(x - 1)$ e) $25(\frac{1}{25}x^2 - 1)$

158. Factor: $(3a + 2b)^2 - 16$

a) $(3a + 2b + 4)(3a + 2b - 4)$ b) $(3a - 2b + 4)(3a + 2b - 4)$ c) $(3a - 2b + 4)(3a - 2b - 4)$
d) $(3a + 2b - 4)^2$ e) $(3a + 2b + 4)(3a - 2b - 4)$

159. Factor: $(3x - 4)^2 - (x + 3)^2$

- a)
- $(4x - 1)(7 - 2x)$
- b)
- $(4x - 7)(2x - 1)$
- c)
- $(4x - 1)(2x - 7)$
- d)
- $(3x - 1)(2x - 7)$
- e)
- $(3x - 1)(x - 7)$

160. Solve: $4t^2 - 1 = 15$

- a)
- ± 5
- b)
- ± 4
- c)
- ± 3
- d)
- ± 2
- e)
- ± 1

161. Solve: $x^2 + 7x - 44 = 0$

- a) 11, -4 b) -11, 4 c) -7, 44 d) 15, -2 e) 0, 44

162. Solve: $x^2 + 7x - 44 = 0$

- a) 11, -4 b) -11, 4 c) -7, 44 d) 15, -2 e) 0, 44

163. Determine the roots of $x^2 + 12x - 6 = 7x$.

- a) 6, -1 b) 1, -6 c) 5, -1 d) 1, -5 e) 6, -1, 0

164. Which value(s) of s are not permitted for the rational expression $\frac{s^2 + 9s + 14}{s^2 - 6s - 27}$?

- a) -3, -9 b) -2, -7 c) -3 d) 3, 9 e) 9, -3

165. For which value(s) of y is $\frac{6y - 3}{y^2 - 49}$ not defined?

- a) -7 b) 7, -7 c) 49, -49 d) 2 e) 7

166. Reduce $\frac{54x}{-9y}$ to lowest terms.

- a)
- $-\frac{6x}{y}$
- b)
- $\frac{y}{6x}$
- c)
- $\frac{6x}{y}$
- d)
- $-\frac{y}{6x}$
- e)
- $-486xy$

167. Reduce $\frac{-336x^2y^3}{8x^3y^2}$ to lowest terms.

- a)
- $\frac{42y}{x}$
- b)
- $42x^5y^5$
- c)
- $-\frac{42y}{x}$
- d)
- $-42xy$
- e)
- -42

168. Simplify: $\frac{16a - 16b}{4b - 4a}$

- a) 4 b)
- $\frac{16(b - a)}{4(a - b)}$
- c) -4 d)
- $\frac{4(a + b)}{(b + a)}$
- e)
- $\frac{a - b}{b - a}$

169. Simplify: $\frac{8t^2 - 128}{4t^2 + 36t + 80}$

- a)
- $-\frac{2(t - 4)}{(t + 5)}$
- b)
- $\frac{8(t - 4)}{4(t + 5)}$
- c)
- $\frac{t - 4}{t + 5}$
- d)
- $\frac{2(t - 4)}{t + 5}$
- e)
- $\frac{2(t + 5)}{t - 4}$

170. Simplify: $\frac{(x^2 - 49)(x^2 - 81)}{x^2 + 15x + 56}$

- a) $\frac{(x-7)(x^2-81)}{x+8}$ b) $\frac{(x+7)(x^2-81)}{x+8}$ c) $\frac{(x+8)(x^2-81)}{x+7}$ d) $\frac{(x-9)(x^2-81)}{x+8}$ e) $\frac{(x+9)(x^2-81)}{x+3}$

171. Simplify: $\frac{20b^2}{8} \times \frac{16}{5b}$

- a) $8b$ b) $\frac{8b^2}{b}$ c) $\frac{320b^2}{40b}$ d) $\frac{8b^3}{b^2}$ e) $\frac{1}{8b}$

172. Simplify: $\frac{3x^3y^2}{4xy} \times \frac{(2xy)^2}{5xy}$

- a) $\frac{3x^3y}{5}$ b) $\frac{3x^3y^2}{5}$ c) $\frac{5x^3y^2}{3}$ d) $\frac{3}{5x^3y^2}$ e) $\frac{3x^2y^3}{5}$

173. Simplify: $\frac{6x^2 - 8}{x - 3y} \cdot \frac{36y^2 - 4x^2}{9x^2 - 12}$

- a) $\frac{x^2 - 6xy}{3x}$ b) $\frac{x - 3y}{3}$ c) $\frac{8(x^2 - 3y)}{2}$ d) $\frac{-8(3y + x)}{3}$ e) $8(x - 3y)$

174. Simplify: $\frac{7}{\left(\frac{7}{10}\right)}$

- a) $\frac{10}{49}$ b) $\frac{49}{10}$ c) 10 d) 49 e) 490

175. Simplify: $\frac{16n}{-18} \div \frac{-4n}{9n}$

- a) 2 b) $2n$ c) $\frac{36n}{72}$ d) $\frac{72}{36n}$ e) $\frac{n}{2}$

176. Simplify: $\frac{3(2x-6)}{15} \div \frac{2(2x-6)}{5x}$

- a) $\frac{6(2x-6)^2}{75x}$ b) $\frac{9}{2x}$ c) $\frac{6-2x}{x}$ d) $\frac{2x-6}{3x}$ e) $\frac{x}{2}$

177. Simplify: $\frac{a^2 - 2a - 15}{25 - a} \div \frac{a + 3}{a + 2}$

- a) $\frac{a+2}{a+5}$ b) $\frac{a^2 - 3a - 10}{5 - a}$ c) $\frac{a^2 - 3a - 10}{25 - a}$ d) $\frac{a+2}{a-5}$ e) $\frac{a^2 - 3a - 10}{(5-a)(5+a)}$

178. Simplify: $\frac{\left(\frac{4xy}{8x^2 - 12x}\right)}{\left(\frac{12y}{8x^2 - 16}\right)}$

- a) $\frac{x^2y - 4y}{6xy - 9y}$ b) $\frac{x^2 + 4}{6x - 9}$ c) $\frac{2x^2 - 4}{6x - 9}$ d) $\frac{6x - 9}{x^2 - 4}$ e) $48xy^2 + 192x$

179. Simplify: $\frac{(3a+4b)^2}{2a-3b} \times \frac{4a^2-9b^2}{9a^2-16b^2} \div \frac{2a+3b}{3a-4b}$

a) $3a+4b$

b) $(3a+4b)(2a+3b)$

c) $\frac{1}{3a-4b}$

d) $\frac{(2a+3b)(3a+4b)}{3a-4b}$

e) $\frac{(2a+3b)^2}{(3a+4b)^2}$

180. Simplify: $\frac{8}{x} - \frac{4}{x}$

a) $\frac{4}{x}$

b) $12x^2$

c) 4

d) $-\frac{4}{x}$

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

181. Simplify: $\frac{13a}{4} - \frac{11a}{3}$

a) $\frac{5a}{12}$

b) $-\frac{10a}{24}$

c) 2a

d) $-\frac{5a}{12}$

e) $\frac{2a}{5}$

182. Simplify: $\frac{4}{7x} - \frac{12x}{21x^2}$

a) $-\frac{4-12x}{7x^2-21x^2}$

b) $\frac{12x-12x^2}{21x^2}$

c) $\frac{12x-12x}{7x^2-21x^2}$

d) $\frac{12x}{21x^2}$

e) 0

183. Simplify: $\frac{6m}{3} - \frac{3m}{6} + \frac{m}{3}$

a) $\frac{6}{11m}$

b) $\frac{11m}{6}$

c) $\frac{2m}{6}$

d) $\frac{m}{3}$

e) 3m

184. Simplify: $\frac{2}{3k} - \frac{7}{9k} + \frac{4}{3k}$

a) $\frac{9k}{23}$

b) $\frac{11}{9k}$

c) 9k

d) $\frac{23}{3k}$

e) $\frac{23}{9k}$

185. Simplify: $\frac{\frac{1}{3} + x}{\frac{1}{3} - x}$

a) $\frac{1 - \frac{1}{9x}}{1 + 2x}$

b) $\frac{1 - 3x}{1 - 3x}$

c) $1 - 3x$

d) $\frac{1 + 3x}{1 - 3x}$

e) $\frac{1}{9} - x$

186. Simplify: $\frac{\frac{1}{9} + 6x}{\frac{1}{9} - 3x}$

a) $\frac{1 + 54x}{1 - 27x}$

b) $\frac{1 + 54x}{1 + 27x}$

c) -2

d) $\frac{\frac{1}{2} - 2x}{\frac{1}{3} - x}$

e) undefined

187. Simplify: $\frac{4d+5}{d-1} - \frac{2d-2}{d-1}$

a) $\frac{-2d-7}{d-1}$

b) $\frac{2d+7}{d-1}$

c) $\frac{2d-7}{d-1}$

d) $\frac{-2d+7}{d-1}$

e) $\frac{6d+7}{d-1}$

188. Simplify: $\frac{9}{y-2} - \frac{2}{y}$

- a) $\frac{-7y+4}{y^2-2y}$ b) $\frac{-7y-4}{y^2-2y}$ c) $\frac{7y-4}{y^2-2y}$ d) $\frac{7y+4}{y^2-2y}$ e) $\frac{7y+2}{y^2-2y}$

189. Simplify: $\frac{x}{x-4} - \frac{6x}{x-5}$

- a) $\frac{5x^2-9x+20}{(x-4)(x-5)}$ b) $\frac{7x^2-5x-24}{(x-4)(x-5)}$ c) $\frac{-5x^2+19x}{(x-4)(x-5)}$ d) $\frac{-7x^2+5x-24}{(x-4)(x-5)}$ e) $\frac{5x^2-5x+24}{(x-4)(x-5)}$

190. Simplify: $\frac{9x}{4x+4} - \frac{x-1}{5x+5}$

- a) $\frac{20x+20}{41x+4}$ b) $\frac{20x-20}{41x-4}$ c) $\frac{41x+4}{20x-20}$ d) $\frac{41x+4}{20x+20}$ e) $\frac{41x-4}{20x+20}$

191. Simplify: $\frac{3}{x+2} - \frac{4}{x^2-4}$

- a) $\frac{3x-2}{(x+2)(x-2)}$ b) $\frac{3x+10}{(x+2)(x-2)}$ c) $\frac{3x-10}{(x-2)(x-2)}$ d) $\frac{3x-10}{(x-2)^2}$ e) $\frac{3x-10}{(x+2)(x-2)}$

192. Solve for a : $\frac{9a}{4} = 36$

- a) -16 b) $-\frac{324}{4}$ c) $-\frac{1}{16}$ d) $\frac{1}{16}$ e) 16

193. Solve for x : $\frac{24}{x} = \frac{2x}{12}$

- a) -12 b) 12 c) $12, -12$ d) $144, -144$ e) 288

194. Solve for x : $\frac{x}{8} + \frac{10}{x} = \frac{x+5}{8}$

- a) -15 b) 0 c) $\pm\sqrt{16}$ d) 16 e) $\sqrt{15}$

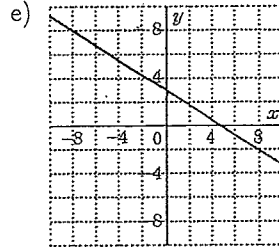
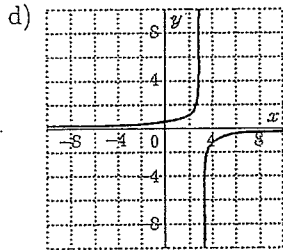
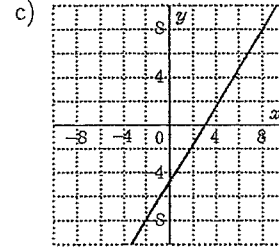
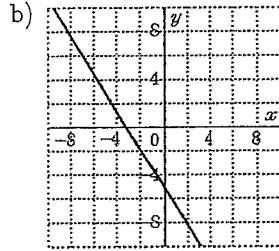
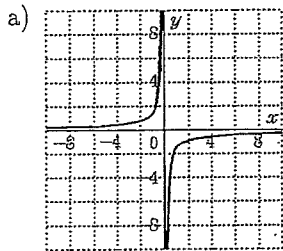
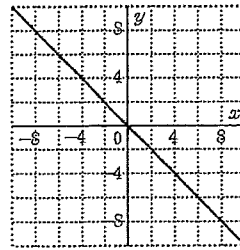
195. Solve: $\frac{1}{3x-3} = \frac{2}{7x-7}$

- a) -4 b) -1 c) 0 d) 1 e) 4

196. Solve: $x + \frac{15}{x+8} = 8$

- a) -7 only b) $\frac{7}{8}$ only c) 7 only d) ± 7 only e) ± 8 only

197. Which graph represents the reciprocal function of $f(x)$?



198. Which pair of functions are graphed on the grid?

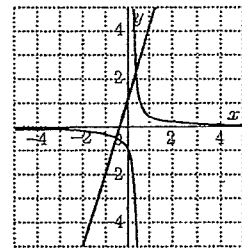
a) $y = 3x + 1$ and $y = \frac{1}{4x} - 1$

b) $y = 3x + 1$ and $y = \frac{1}{-4x + 1}$

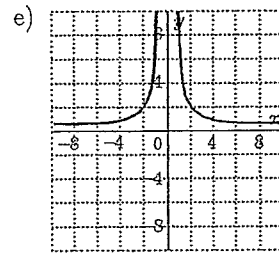
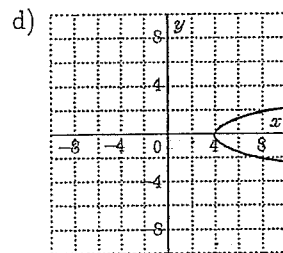
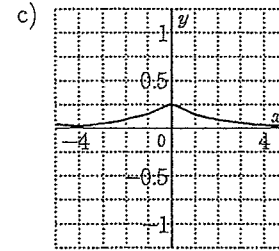
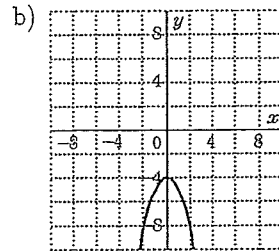
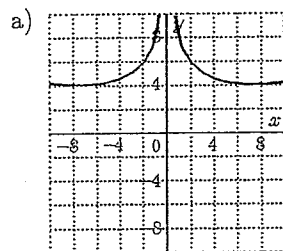
c) $y = -3x + 1$ and $y = \frac{1}{-4x - 1}$

d) $y = -3x + 1$ and $y = -\frac{1}{4x} - 1$

e) $y = 3x + 1$ and $y = \frac{1}{4x - 1}$



199. Which is the graph of the reciprocal function of $y = x^2 + 4$?



200. Which of the following represents the graph of $y = \frac{1}{x^2 - 9}$?

