**PreCalc Review**

**Multiple Choice**

*Identify the choice that best completes the statement or answers the question.*

**\_\_\_\_ 1.** Which point on the number line has an absolute value of ?



|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **A.** | X | **B.** | W | **C.** | Z | **D.** | Y |

**\_\_\_\_ 2.** What is the distance between –18.1 and 9.7 on a number line?

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **A.** | 13.9 | **B.** | 27.8 | **C.** | 16.8 | **D.** | 8.4 |

**\_\_\_\_ 3.** What is the distance between  and  on a number line?

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **A.** |  | **B.** |  | **C.** |  | **D.** |  |

**\_\_\_\_ 4.** Evaluate: 

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **A.** | 4.9 | **B.** | 2.21 | **C.** | –9.8 | **D.** | 16.5 |

**\_\_\_\_ 5.** Evaluate: 

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **A.** | 384 | **B.** | –68 | **C.** | 429 | **D.** | –384 |

**\_\_\_\_ 6.** Evaluate  when .

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **A.** | 57 | **B.** | 50 | **C.** | 27 | **D.** | 123 |

**\_\_\_\_ 7.** Evaluate  when .

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **A.** | 7252 | **B.** | 7259 | **C.** | 7189 | **D.** | 7217 |

**\_\_\_\_ 8.** Write this mixed radical as an entire radical: 

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **A.** |  | **B.** |  | **C.** |  | **D.** |  |

**\_\_\_\_ 9.** Write this mixed radical as an entire radical: 

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **A.** |  | **B.** |  | **C.** |  | **D.** |  |

**\_\_\_\_ 10.** Write this entire radical as a mixed radical: 

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **A.** |  | **B.** |  | **C.** |  | **D.** |  |

**\_\_\_\_ 11.** Write this entire radical as a mixed radical: 

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **A.** |  | **B.** |  | **C.** |  | **D.** |  |

**\_\_\_\_ 12.** Arrange these radicals in order from greatest to least.

i) 

ii) 

iii) 

iv) 

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** | iii, ii, iv, i | **C.** | iii, i, iv, ii |
| **B.** | ii, iv, i, iii | **D.** | i, iii, iv, ii |

**\_\_\_\_ 13.** Arrange these radicals in order from greatest to least.

i) 

ii) 

iii) 

iv) 

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** | iv, i, iii, ii | **C.** | iii, ii, i, iv |
| **B.** | ii, iii, i, iv | **D.** | ii, iv, i, iii |

**\_\_\_\_ 14.** For which values of the variable, *x*, is this radical defined?



|  |  |  |  |
| --- | --- | --- | --- |
| **A.** |  | **C.** |  |
| **B.** |  | **D.** |  |

**\_\_\_\_ 15.** Write this radical in simplest form: 

Then state the values of the variable, *y*, for which the radical is defined.

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** |  | **C.** |  |
| **B.** |  | **D.** | , |

**\_\_\_\_ 16.** Write this radical in simplest form: 

Then state the values of the variables, *a* and *b*, for which the radical is defined.

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** |  | **C.** |  |
| **B.** |  | **D.** |  |

**\_\_\_\_ 17.** Which statement is true?

i) 

ii) 

iii) 

iv) .

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **A.** | ii | **B.** | i | **C.** | iv | **D.** | iii |

**\_\_\_\_ 18.** Simplify this radical, if possible: 

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** |  | **C.** |  |
| **B.** |  | **D.** | cannot be simplified |

**\_\_\_\_ 19.** Simplify by adding or subtracting like terms: 

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** |  | **C.** |  |
| **B.** |  | **D.** |  |

**\_\_\_\_ 20.** Simplify: 

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **A.** |  | **B.** |  | **C.** |  | **D.** |  |

**\_\_\_\_ 21.** Simplify by adding or subtracting like terms: 

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **A.** |  | **B.** |  | **C.** |  | **D.** | 0 |

**\_\_\_\_ 22.** Simplify by adding or subtracting like terms: 

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **A.** |  | **B.** |  | **C.** |  | **D.** |  |

**\_\_\_\_ 23.** Simplify by adding or subtracting like terms: 

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** |  | **C.** |  |
| **B.** |  | **D.** |  |

**\_\_\_\_ 24.** Identify the values of the variable for which each radical is defined, then simplify.



|  |  |  |  |
| --- | --- | --- | --- |
| **A.** |  | **C.** |  |
| **B.** |  | **D.** |  |

**\_\_\_\_ 25.** Simplify by adding or subtracting like terms: 

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** |  | **C.** |  |
| **B.** |  | **D.** |  |

**\_\_\_\_ 26.** Expand and simplify this expression: 

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** |  | **C.** |  |
| **B.** |  | **D.** |  |

**\_\_\_\_ 27.** Expand and simplify this expression: 

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** |  | **C.** |  |
| **B.** |  | **D.** |  |

**\_\_\_\_ 28.** Expand and simplify this expression: 

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** |  | **C.** |  |
| **B.** |  | **D.** |  |

**\_\_\_\_ 29.** Rationalize the denominator: 

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **A.** |  | **B.** |  | **C.** |  | **D.** |  |

**\_\_\_\_ 30.** Expand and simplify this expression: 

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** |  | **C.** |  |
| **B.** |  | **D.** |  |

**\_\_\_\_ 31.** Expand and simplify this expression: 

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** |  | **C.** |  |
| **B.** |  | **D.** |  |

**\_\_\_\_ 32.** Expand and simplify this expression: 

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** |  | **C.** |  |
| **B.** |  | **D.** |  |

**\_\_\_\_ 33.** Expand and simplify this expression: 

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** |  | **C.** |  |
| **B.** |  | **D.** |  |

**\_\_\_\_ 34.** Expand and simplify this expression: 

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** |  | **C.** |  |
| **B.** |  | **D.** |  |

**\_\_\_\_ 35.** Simplify this expression: 

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** |  | **C.** |  |
| **B.** |  | **D.** |  |

**\_\_\_\_ 36.** Simplify this expression: 

|  |  |
| --- | --- |
| **A.** |  |
| **B.** |  |
| **C.** |  |
| **D.** |  |

**\_\_\_\_ 37.** Solve this equation: 

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **A.** | *x* = | **B.** | *x* = | **C.** | *x* = | **D.** | *x* = |

**\_\_\_\_ 38.** Solve this equation: 

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **A.** |  | **B.** |  | **C.** |  | **D.** |  |

**\_\_\_\_ 39.** Solve this equation: 

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **A.** | *x* = 9 | **B.** | *x* = 8 | **C.** | *x* = 7 | **D.** | *x* = 10 |

**\_\_\_\_ 40.** Solve this equation: 

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** | *x* =  and *x* = | **C.** | *x* = |
| **B.** | *x* = | **D.** | *x* = |

**\_\_\_\_ 41.** Solve this equation: 

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **A.** | *x* = 144 | **B.** | *x* = 12 | **C.** | *x* = 7 | **D.** | *x* = 3 |

**\_\_\_\_ 42.** Solve this equation: 

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **A.** | *x* = | **B.** | *x* = 25 | **C.** | *x* = 5 | **D.** | *x* = 10 |

**\_\_\_\_ 43.** Solve this equation: 

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **A.** | *x* = 4 | **B.** | *x* = 8 | **C.** | *x* = | **D.** | *x* = 16 |

**\_\_\_\_ 44.** Solve this equation: 

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **A.** | *x* = –3 | **B.** | *x* = 9 | **C.** | *x* = 3 | **D.** | *x* = –9 |

**\_\_\_\_ 45.** Factor: 

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** | (*x* – 3)(*x* – 4) | **C.** | (*x* + 3)(*x* + 4) |
| **B.** | (*x* – 3)(*x* + 4) | **D.** | (*x* + 3)(*x* – 4) |

**\_\_\_\_ 46.** Factor this polynomial: 

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** | ()() | **C.** | ()() |
| **B.** | ()() | **D.** | ()() |

**\_\_\_\_ 47.** Factor this polynomial expression: 

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** |  | **C.** |  |
| **B.** |  | **D.** |  |

**\_\_\_\_ 48.** Factor this polynomial expression: 

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** |  | **C.** |  |
| **B.** |  | **D.** |  |

**\_\_\_\_ 49.** Factor: 

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** |  | **C.** |  |
| **B.** |  | **D.** |  |

**\_\_\_\_ 50.** Solve this equation: 

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** | or | **C.** | or |
| **B.** | or | **D.** | or |

**\_\_\_\_ 51.** Solve: 

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** | *x* =  or *x* = | **C.** | *x* =  or *x* = |
| **B.** | *x* =  or *x* = | **D.** | *x* =  or *x* = |

**\_\_\_\_ 52.** Solve by factoring: 

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** | or | **C.** |  |
| **B.** |  | **D.** | or |

**\_\_\_\_ 53.** Solve by factoring: 

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** |  | **C.** |  |
| **B.** |  | **D.** |  |

**\_\_\_\_ 54.** Solve by factoring: 

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** |  | **C.** |  |
| **B.** |  | **D.** |  |

**\_\_\_\_ 55.** Solve this equation: 

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** |  | **C.** |  |
| **B.** |  | **D.** |  |

**\_\_\_\_ 56.** Determine the value of *x*. Give the answer to the nearest tenth.



|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **A.** | 11.8 m | **B.** | 10.1 m | **C.** | 5.9 m | **D.** | 8.4 m |

**\_\_\_\_ 57.** Determine the value of  that makes  a perfect square.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **A.** | 169 | **B.** | 84.5 | **C.** | 6.5 | **D.** | 42.25 |

**\_\_\_\_ 58.** A square garden in a city park is to be expanded. The length of each side of the garden is to be increased by 10 m. The area of the new garden will be 144 m2. Determine the side length of the original garden.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **A.** | 12 m | **B.** | m | **C.** | 2 m | **D.** | 22 m |

**\_\_\_\_ 59.** Solve  by completing the square.

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** |  | **C.** |  |
| **B.** |  | **D.** |  |

**\_\_\_\_ 60.** Solve ** by completing the square.

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** |  | **C.** |  |
| **B.** |  | **D.** |  |

**\_\_\_\_ 61.** Solve this equation: 

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** |  | **C.** |  |
| **B.** |  | **D.** | or |

**\_\_\_\_ 62.** What is the coefficient of *x* in the quadratic equation ?

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **A.** | –1 | **B.** | –6 | **C.** | 6 | **D.** | 8 |

**\_\_\_\_ 63.** Solve this quadratic equation: **

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** |  | **C.** |  |
| **B.** |  | **D.** |  |

**\_\_\_\_ 64.** Solve this quadratic equation: 

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** |  | **C.** |  |
| **B.** |  | **D.** |  |

**\_\_\_\_ 65.** Solve this quadratic equation: 

Give the solution to 2 decimal places.

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** | or | **C.** | or |
| **B.** | or | **D.** | or |

**\_\_\_\_ 66.** The quadratic equation  has only one root.

Use the quadratic formula to determine the value of *d*.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **A.** |  | **B.** |  | **C.** |  | **D.** |  |

**\_\_\_\_ 67.** Without solving, determine the number of real roots of this equation: 

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **A.** | 2 | **B.** | 0 | **C.** | 1 |

**\_\_\_\_ 68.** Without solving, determine the number of real roots of this equation: 

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **A.** | 0 | **B.** | 2 | **C.** | 1 |

**\_\_\_\_ 69.** Calculate the value of the discriminant for this equation: 

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **A.** | –9 | **B.** | 15 | **C.** | 0 | **D.** | 12 |

**\_\_\_\_ 70.** Calculate the value of the discriminant for this equation: 

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **A.** | 20 | **B.** | 24 | **C.** | 5 | **D.** | –6 |

**\_\_\_\_ 71.** What are the coordinates of the vertex of this graph of a quadratic function?



|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **A.** | (–4, –2) | **B.** | (–2, –4) | **C.** | (4, –2) | **D.** | (2, –4) |

**\_\_\_\_ 72.** Identify the *y*-intercept of the graph of this quadratic function: 

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **A.** | 37 | **B.** | 0 | **C.** | 39 | **D.** | 4 |

**\_\_\_\_ 73.** Identify the *y*-intercept of the graph of this quadratic function: 

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **A.** | 23 | **B.** | 13 | **C.** | –27 | **D.** | –23 |

**\_\_\_\_ 74.** Use a graphing calculator to determine the *x*-intercepts of the quadratic function . Write the intercepts to the nearest hundredth, if necessary.

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** | –1.51 and 0.73 | **C.** | –1.12 and 1.12 |
| **B.** | –0.73 and 1.51 | **D.** | –3.02 and 1.47 |

**\_\_\_\_ 75.** A rectangular dog pen is to be enclosed with 20 m of fencing. The area of the dog pen, *A* square metres, is modelled by the function , where *x* is the width, in metres. What is the width that gives maximum area? Write the answer to the nearest tenth, if necessary.

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** | 5 m | **C.** | 20 m |
| **B.** | 25 m | **D.** | 10 m |

**\_\_\_\_ 76.** Use the graph of  to determine the roots of .



|  |  |  |  |
| --- | --- | --- | --- |
| **A.** | and | **C.** | and |
| **B.** | and | **D.** | and |

**\_\_\_\_ 77.** Use graphing technology to approximate the solution of this equation: 

Write the roots to 1 decimal place.

|  |  |
| --- | --- |
| **A.** | The roots are approximately  and . |
| **B.** | The roots are approximately  and . |
| **C.** | The roots are approximately  and . |
| **D.** | The roots are approximately  and . |

**\_\_\_\_ 78.** Point P(2, 6) is on the terminal arm of an angle ** in standard position. Determine the exact value of sin **.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **A.** |  | **B.** |  | **C.** |  | **D.** |  |

**\_\_\_\_ 79.** Point P(7, 9) is on the terminal arm of an angle ** in standard position. Determine the measure of ** to the nearest degree.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **A.** |  | **B.** |  | **C.** |  | **D.** |  |

**\_\_\_\_ 80.** Point P(*x*, *y*) is on the terminal arm of a 35° angle in standard position. The distance *r* between P and the origin is 7. To the nearest tenth, determine the coordinates of P.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **A.** | (5.7, 4.0) | **B.** | (4.0, 5.7) | **C.** | (2.4, 6.6) | **D.** | (8.0, 11.5) |

**\_\_\_\_ 81.** A wheelchair ramp is 8.0 m long. Its angle of inclination is 9. Calculate the rise of the ramp to the nearest tenth of a metre.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **A.** | 5.1 m | **B.** | 1.2 m | **C.** | 1.3 m | **D.** | 7.9 m |

**\_\_\_\_ 82.** A guy wire is attached to a tower at a point that is 5.5 m above the ground. The angle between the wire and the level ground is 52. To the nearest tenth of a metre, how far from the base of the tower is the wire anchored to the ground?

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **A.** | 4.3 m | **B.** | 3.4 m | **C.** | 7.0 m | **D.** | 7.0 m |

**\_\_\_\_ 83.** A helicopter is ascending vertically. On the ground, a searchlight is 175 m from the point where the helicopter lifted off. It shines on the helicopter and the angle the beam makes with the ground is 50. To the nearest metre, how high is the helicopter at this point?

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **A.** | 147 m | **B.** | 134 m | **C.** | 209 m | **D.** | 272 m |

**\_\_\_\_ 84.** A flagpole casts a shadow that is 15 m long when the angle between the sun’s rays and the ground is 48. Determine the height of the flagpole to the nearest metre.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **A.** | 10 m | **B.** | 11 m | **C.** | 14 m | **D.** | 17 m |

**\_\_\_\_ 85.** Determine the reference angle for the angle 290° in standard position.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **A.** | 290° | **B.** | 20° | **C.** | 110° | **D.** | 70° |

**\_\_\_\_ 86.** Point P(1, –2) lies on the terminal arm of an angle in standard position. What are the coordinates of point P when it is reflected in the *y*-axis? What is the reference angle for this angle to the nearest degree?

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** | P(–1, –2); 63° | **C.** | P(–2, –1); 153° |
| **B.** | P(1, 2); 117° | **D.** | P(2, 1); 243° |

**\_\_\_\_ 87.** Determine the exact value of tan 210.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **A.** |  | **B.** |  | **C.** |  | **D.** |  |

**\_\_\_\_ 88.** The point P(4, –3) lies on the terminal arm of an angle ** in standard position. Determine the measure of ** to the nearest degree.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **A.** | 323° | **B.** | –143° | **C.** | 233° | **D.** | 127° |

**\_\_\_\_ 89.** Point P(5, 0) is a terminal point of an angle ** in standard position. Determine the value of cos **.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **A.** | undefined | **B.** | 0 | **C.** | 5 | **D.** | 1 |

**\_\_\_\_ 90.** Determine the possible coordinates (*x*, *y*) of a terminal point for the angle 150° in standard position.The value of *r* is 5, where .

|  |  |  |  |
| --- | --- | --- | --- |
| **A.** |  | **C.** |  |
| **B.** |  | **D.** |  |

**\_\_\_\_ 91.** In PQR, PQ = 6.2 cm and P = 46°. For what value of QR is PQR a right triangle with ? Where necessary, give the answer to the nearest tenth.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **A.** | 4.5 cm | **B.** | 5.9 cm | **C.** | 8.6 cm | **D.** | 6.2 cm |

**\_\_\_\_ 92.** For ABC, determine the measure of A to the nearest degree.



|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **A.** | 144° | **B.** | 43° | **C.** | 120° | **D.** | 77° |

**\_\_\_\_ 93.** For XYZ, determine the measure of Z to the nearest degree and the measure of XZ to the nearest tenth of a centimetre.



|  |  |  |  |
| --- | --- | --- | --- |
| **A.** | Z = 28°; XZ = 7.3 cm | **C.** | Z = 53°; XZ = 8.0 cm |
| **B.** | Z = 30°; XZ = 12.1 cm | **D.** | Z = 59°; XZ = 4.8 cm |

**\_\_\_\_ 94.** In PQR, determine the measure of Q to the nearest degree.



|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **A.** | 70° | **B.** | 110° | **C.** | 136° | **D.** | 154° |

**\_\_\_\_ 95.** In MNP, determine the lengths of the two unknown sides to the nearest tenth of a centimetre.



|  |  |  |  |
| --- | --- | --- | --- |
| **A.** | NP = 12.0 cm; MP = 4.8 cm | **C.** | NP = 19.7 cm; MP = 4.7 cm |
| **B.** | NP = 7.4 cm; MP = 12.1 cm | **D.** | NP = 19.7 cm; MP = 4.8 cm |

**\_\_\_\_ 96.** In PMN, determine the length of PN to the nearest tenth of a centimetre.



|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **A.** | 9.2 cm | **B.** | 47.4 cm | **C.** | 13.9 cm | **D.** | 6.9 cm |

**\_\_\_\_ 97.** In XYZ, determine the length of XZ to the nearest tenth of a centimetre.



|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **A.** | 161.5 cm | **B.** | 7.7 cm | **C.** | 12.7 cm | **D.** | 11.7 cm |

**\_\_\_\_ 98.** In KLM, determine the length of KM to the nearest tenth of a centimetre.



|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **A.** | 11.2 cm | **B.** | 5.8 cm | **C.** | 11.3 cm | **D.** | 126.4 cm |

**\_\_\_\_ 99.** In DEF, determine the measure of Fto the nearest degree.



|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **A.** | 51 | **B.** | 52 | **C.** | 0 | **D.** | 62 |

**\_\_\_\_ 100.** In PQR, determine the measure of R to the nearest degree.



|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **A.** | 42° | **B.** | 86° | **C.** | 83° | **D.** | 7° |

**Short Answer**

**1.** Determine the root of each equation.

a) 

b) 

c) 

d) 

**2.** Factor this polynomial: 

**3.** Factor this polynomial: 

**4.** The total area of the large rectangle below is 24 m2. Determine the value of *x*.



**5.** Solve this equation: 

**6.** When 3 times a number is added to the square of the number, the result is 40.

Determine the number.

**7.** Solve this equation: 

**8.** The velocity of a falling object can be determined using the formula , where *v* is the velocity in metres per second and *h* metres is the distance the object has fallen. What is the velocity of an object that has fallen 29 m. Give the answer to the nearest tenth.

**9.** Consider the quadratic equation , where *b* is a constant.

Determine the possible values of *b* so that this equation has real solutions.

**10.** Consider the quadratic equation . Determine the possible values of *c* so that this equation has no solution.

**11.** A car was travelling at a constant speed of 15 m/s, then accelerated for 10 s. The distance travelled during this time, *d* metres, is given by the formula , where *t* is the time in seconds since the acceleration began. How long did it take the car to travel 500 m? Give the answer to the nearest tenth of a second.

**12.** a) Calculate the value of the discriminant for the equation .

b) How many roots does the equation have?

**13.** a) Use a table of values to graph the quadratic function .

b) Determine the domain of the function.

c) Determine the range of the function.

**14.** Using graphing technology to approximate the solution of this equation: 

Write the roots to 1 decimal place.

**15.** Sketch this angle in standard position: 



**16.** What is the distance from the origin to the point P(3, 2)?

**17.** a) Determine the reference angle for the angle 344° in standard position.

b) Determine the other angles between 0° and 360° that have the same reference angle.

**18.** Given the following information about ABC, determine how many triangles can be constructed.

*a* = 5.6 cm, *c* = 7.8 cm, A = 38°

**19.** For XYZ, can the Cosine Law be used to determine the length of XZ? If your answer is yes, determine the length to the nearest tenth of a centimetre. If your answer is no, explain why.



**20.** In DEF, DE = 4.7 m, EF = 2.9 m, and DF = 6.2 m; determine the measure of E to the nearest degree.

**Problem**

**1.** Mark each number on the number line below and indicate its distance from 0.

A = 12 B = 9 C =  D = –18.5



**2.** Expand and simplify this expression: 

Show your work.

**3.** a) Identify the values of the variables for which this expression is defined.

b) Write the expression in simplest form. Show your work.



**4.** Determine whether the given value of *x* is a root of this equation. Justify your answer.

; 

**5.** Consider the polynomial . Determine a value for *k* so that  is a factor of the polynomial. Explain your strategy.

**6.** The perimeter, *P*, of a rectangular concrete slab is 46 m and its area, *A*, is 90 m2.

Use the formula . Determine the dimensions of the slab. Show your work.

**7.** A ball is thrown in the air. The approximate height of the ball, *h* metres, after *t* seconds can be modelled by the equation . Will the ball ever reach a height of 15 m? Explain your answer.

**8.** a) Solve this quadratic equation by expanding, simplifying, then applying the quadratic formula: 

b) Solve the equation in part a using the quadratic formula without expanding.

**9.** Determine the values of *k* for which the equation  has no real roots, then write a possible equation.

**10.** Use graphing technology to solve this equation: 

Explain your strategy.

**11.** Determine the measures of A and B to the nearest tenth of a degree. Explain your strategy.



**12.** A guy wire helps to support a tower as shown. Determine the height of the tower to the nearest tenth of a metre. What assumptions about the ground are you making? Explain your work.



**13.** Guy wires are attached to buildings as shown. A student says the angles of inclination of the wires are the same. Is the student correct? Justify your answer.



**14.** Point P(9, –4) is a terminal point of an angle ** in standard position. Determine ** to the nearest degree, then sketch the angle. Show your work.

**15.** In ABC, AB = 6 cm and . Complete the chart below for your own values of BC.

|  |  |  |  |
| --- | --- | --- | --- |
| **Length of BC (cm)** | **Value of** | **How does  compare with sin A?** | **Description of possible triangles** |
|  |  |  | No triangles are possible. |
|  |  |  | 1 isosceles triangle |
|  |  |  | 1 scalene triangle |
|  |  |  | 2 scalene triangles |

**16.** Two divers are 50 m apart. Each diver sees a treasure chest on the sea floor. The treasure chest is vertically below the line between the divers. From the divers, the angles of depression to the treasure chest are 35° and 51°. To the nearest metre, how far is the treasure chest from each diver? Consider possible cases and show your work.

**17.** Two fishing boats are 18 m apart. The fishermen in each boat see a school of fish vertically below the line through the boats. From the boats, the angles of depression to the fish are 35° and 51°. To the nearest metre, how far below sea level is the school of fish? Consider possible cases and show your work.

**18.** In DEF, DE = 7.5 cm, D = 70°, and EF = 9 cm.

a) Determine how many triangles can be drawn.

b) Solve the triangle(s). Give angle measures to the nearest degree and side lengths to the nearest tenth of a centimetre.

Show your work.

**19.** In trapezoid ABCD, calculate the length of diagonal AC to the nearest tenth. Show your work.



**20.** A pair of campers paddle a canoe 3.4 km [W24°N], then 2.4 km [S28°E]. To the nearest tenth of a kilometre, what is the straight-line distance from their start point to their end point? To the nearest degree, what is the bearing of the end point from the start point? Show your work.

**PreCalc Review**

**Answer Section**

**MULTIPLE CHOICE**

**1.** ANS: C PTS: 0 DIF: Easy

REF: 2.1 Absolute Value of a Real Number LOC: 11.AN1

TOP: Relations and Functions KEY: Conceptual Understanding

**2.** ANS: B PTS: 0 DIF: Easy

REF: 2.1 Absolute Value of a Real Number LOC: 11.AN1

TOP: Relations and Functions KEY: Conceptual Understanding | Procedural Knowledge

**3.** ANS: B PTS: 0 DIF: Moderate

REF: 2.1 Absolute Value of a Real Number LOC: 11.AN1

TOP: Relations and Functions KEY: Conceptual Understanding | Procedural Knowledge

**4.** ANS: A PTS: 0 DIF: Moderate

REF: 2.1 Absolute Value of a Real Number LOC: 11.AN1

TOP: Relations and Functions KEY: Conceptual Understanding | Procedural Knowledge

**5.** ANS: A PTS: 0 DIF: Moderate

REF: 2.1 Absolute Value of a Real Number LOC: 11.AN1

TOP: Relations and Functions KEY: Conceptual Understanding | Procedural Knowledge

**6.** ANS: A PTS: 0 DIF: Moderate

REF: 2.1 Absolute Value of a Real Number LOC: 11.AN1

TOP: Relations and Functions KEY: Conceptual Understanding | Procedural Knowledge

**7.** ANS: B PTS: 0 DIF: Moderate

REF: 2.1 Absolute Value of a Real Number LOC: 11.AN1

TOP: Relations and Functions KEY: Conceptual Understanding | Procedural Knowledge

**8.** ANS: D PTS: 0 DIF: Easy

REF: 2.2 Simplifying Radical Expressions LOC: 11.AN2

TOP: Relations and Functions KEY: Procedural Knowledge

**9.** ANS: B PTS: 0 DIF: Moderate

REF: 2.2 Simplifying Radical Expressions LOC: 11.AN2

TOP: Relations and Functions KEY: Procedural Knowledge

**10.** ANS: D PTS: 0 DIF: Easy

REF: 2.2 Simplifying Radical Expressions LOC: 11.AN2

TOP: Relations and Functions KEY: Procedural Knowledge

**11.** ANS: D PTS: 0 DIF: Moderate

REF: 2.2 Simplifying Radical Expressions LOC: 11.AN2

TOP: Relations and Functions KEY: Procedural Knowledge

**12.** ANS: C PTS: 0 DIF: Easy

REF: 2.2 Simplifying Radical Expressions LOC: 11.AN2

TOP: Relations and Functions KEY: Procedural Knowledge

**13.** ANS: B PTS: 0 DIF: Moderate

REF: 2.2 Simplifying Radical Expressions LOC: 11.AN2

TOP: Relations and Functions KEY: Procedural Knowledge

**14.** ANS: A PTS: 0 DIF: Moderate

REF: 2.2 Simplifying Radical Expressions LOC: 11.AN2

TOP: Relations and Functions KEY: Conceptual Understanding | Procedural Knowledge

**15.** ANS: B PTS: 0 DIF: Moderate

REF: 2.2 Simplifying Radical Expressions LOC: 11.AN2

TOP: Relations and Functions KEY: Procedural Knowledge

**16.** ANS: A PTS: 0 DIF: Difficult

REF: 2.2 Simplifying Radical Expressions LOC: 11.AN2

TOP: Relations and Functions KEY: Conceptual Understanding | Procedural Knowledge

**17.** ANS: A PTS: 0 DIF: Difficult

REF: 2.2 Simplifying Radical Expressions LOC: 11.AN2

TOP: Relations and Functions KEY: Procedural Knowledge | Conceptual Understanding

**18.** ANS: D PTS: 0 DIF: Easy

REF: 2.3 Adding and Subtracting Radical Expressions LOC: 11.AN2

TOP: Relations and Functions KEY: Procedural Knowledge | Conceptual Understanding

**19.** ANS: A PTS: 0 DIF: Moderate

REF: 2.3 Adding and Subtracting Radical Expressions LOC: 11.AN2

TOP: Relations and Functions KEY: Conceptual Understanding | Procedural Knowledge

**20.** ANS: D PTS: 0 DIF: Easy

REF: 2.3 Adding and Subtracting Radical Expressions LOC: 11.AN2

TOP: Relations and Functions KEY: Conceptual Understanding | Procedural Knowledge

**21.** ANS: A PTS: 0 DIF: Easy

REF: 2.3 Adding and Subtracting Radical Expressions LOC: 11.AN2

TOP: Relations and Functions KEY: Conceptual Understanding | Procedural Knowledge

**22.** ANS: B PTS: 0 DIF: Easy

REF: 2.3 Adding and Subtracting Radical Expressions LOC: 11.AN2

TOP: Relations and Functions KEY: Conceptual Understanding | Procedural Knowledge

**23.** ANS: A PTS: 0 DIF: Moderate

REF: 2.3 Adding and Subtracting Radical Expressions LOC: 11.AN2

TOP: Relations and Functions KEY: Conceptual Understanding | Procedural Knowledge

**24.** ANS: A PTS: 0 DIF: Moderate

REF: 2.3 Adding and Subtracting Radical Expressions LOC: 11.AN2

TOP: Relations and Functions KEY: Conceptual Understanding | Procedural Knowledge

**25.** ANS: B PTS: 0 DIF: Moderate

REF: 2.3 Adding and Subtracting Radical Expressions LOC: 11.AN2

TOP: Relations and Functions KEY: Conceptual Understanding | Procedural Knowledge

**26.** ANS: D PTS: 0 DIF: Easy

REF: 2.4 Multiplying and Dividing Radical Expressions LOC: 11.AN2

TOP: Relations and Functions KEY: Procedural Knowledge

**27.** ANS: B PTS: 0 DIF: Easy

REF: 2.4 Multiplying and Dividing Radical Expressions LOC: 11.AN2

TOP: Relations and Functions KEY: Procedural Knowledge

**28.** ANS: A PTS: 0 DIF: Easy

REF: 2.4 Multiplying and Dividing Radical Expressions LOC: 11.AN2

TOP: Relations and Functions KEY: Procedural Knowledge

**29.** ANS: A PTS: 0 DIF: Easy

REF: 2.4 Multiplying and Dividing Radical Expressions LOC: 11.AN2

TOP: Relations and Functions KEY: Procedural Knowledge

**30.** ANS: C PTS: 0 DIF: Moderate

REF: 2.4 Multiplying and Dividing Radical Expressions LOC: 11.AN2

TOP: Relations and Functions KEY: Conceptual Understanding | Procedural Knowledge

**31.** ANS: D PTS: 0 DIF: Moderate

REF: 2.4 Multiplying and Dividing Radical Expressions LOC: 11.AN2

TOP: Relations and Functions KEY: Conceptual Understanding | Procedural Knowledge

**32.** ANS: A PTS: 0 DIF: Moderate

REF: 2.4 Multiplying and Dividing Radical Expressions LOC: 11.AN2

TOP: Relations and Functions KEY: Conceptual Understanding | Procedural Knowledge

**33.** ANS: B PTS: 0 DIF: Moderate

REF: 2.4 Multiplying and Dividing Radical Expressions LOC: 11.AN2

TOP: Relations and Functions KEY: Conceptual Understanding | Procedural Knowledge

**34.** ANS: A PTS: 0 DIF: Moderate

REF: 2.4 Multiplying and Dividing Radical Expressions LOC: 11.AN2

TOP: Relations and Functions KEY: Conceptual Understanding | Procedural Knowledge

**35.** ANS: A PTS: 0 DIF: Moderate

REF: 2.4 Multiplying and Dividing Radical Expressions LOC: 11.AN2

TOP: Relations and Functions KEY: Conceptual Understanding | Procedural Knowledge

**36.** ANS: B PTS: 0 DIF: Moderate

REF: 2.4 Multiplying and Dividing Radical Expressions LOC: 11.AN2

TOP: Relations and Functions KEY: Conceptual Understanding | Procedural Knowledge

**37.** ANS: C PTS: 0 DIF: Easy REF: 2.5 Solving Radical Equations

LOC: 11.AN3 TOP: Relations and Functions KEY: Procedural Knowledge

**38.** ANS: B PTS: 0 DIF: Moderate REF: 2.5 Solving Radical Equations

LOC: 11.AN3 TOP: Relations and Functions KEY: Procedural Knowledge

**39.** ANS: A PTS: 0 DIF: Easy REF: 2.5 Solving Radical Equations

LOC: 11.AN3 TOP: Relations and Functions KEY: Procedural Knowledge

**40.** ANS: B PTS: 0 DIF: Moderate REF: 2.5 Solving Radical Equations

LOC: 11.AN3 TOP: Relations and Functions

KEY: Conceptual Understanding | Procedural Knowledge

**41.** ANS: A PTS: 0 DIF: Moderate REF: 2.5 Solving Radical Equations

LOC: 11.AN3 TOP: Relations and Functions KEY: Procedural Knowledge

**42.** ANS: C PTS: 0 DIF: Moderate REF: 2.5 Solving Radical Equations

LOC: 11.AN3 TOP: Relations and Functions KEY: Procedural Knowledge

**43.** ANS: A PTS: 0 DIF: Moderate REF: 2.5 Solving Radical Equations

LOC: 11.AN3 TOP: Relations and Functions

KEY: Conceptual Understanding | Procedural Knowledge

**44.** ANS: D PTS: 0 DIF: Difficult REF: 2.5 Solving Radical Equations

LOC: 11.AN3 TOP: Relations and Functions

KEY: Conceptual Understanding | Procedural Knowledge

**45.** ANS: C PTS: 0 DIF: Easy

REF: 3.1 Factoring Polynomial Expressions LOC: 11.RF1

TOP: Relations and Functions KEY: Procedural Knowledge

**46.** ANS: B PTS: 0 DIF: Easy

REF: 3.1 Factoring Polynomial Expressions LOC: 11.RF1

TOP: Relations and Functions KEY: Procedural Knowledge

**47.** ANS: D PTS: 0 DIF: Moderate

REF: 3.1 Factoring Polynomial Expressions LOC: 11.RF1

TOP: Relations and Functions KEY: Procedural Knowledge

**48.** ANS: C PTS: 0 DIF: Moderate

REF: 3.1 Factoring Polynomial Expressions LOC: 11.RF1

TOP: Relations and Functions KEY: Procedural Knowledge

**49.** ANS: D PTS: 0 DIF: Moderate

REF: 3.1 Factoring Polynomial Expressions LOC: 11.RF1

TOP: Relations and Functions KEY: Procedural Knowledge

**50.** ANS: D PTS: 0 DIF: Easy

REF: 3.2 Solving Quadratic Equations by Factoring LOC: 11.RF5

TOP: Relations and Functions KEY: Procedural Knowledge

**51.** ANS: B PTS: 0 DIF: Easy

REF: 3.2 Solving Quadratic Equations by Factoring LOC: 11.RF5

TOP: Relations and Functions KEY: Procedural Knowledge

**52.** ANS: A PTS: 0 DIF: Easy

REF: 3.2 Solving Quadratic Equations by Factoring LOC: 11.RF5

TOP: Relations and Functions KEY: Procedural Knowledge

**53.** ANS: A PTS: 0 DIF: Easy

REF: 3.2 Solving Quadratic Equations by Factoring LOC: 11.RF5

TOP: Relations and Functions KEY: Procedural Knowledge

**54.** ANS: B PTS: 0 DIF: Moderate

REF: 3.2 Solving Quadratic Equations by Factoring LOC: 11.RF5

TOP: Relations and Functions KEY: Procedural Knowledge

**55.** ANS: A PTS: 0 DIF: Easy

REF: 3.3 Using Square Roots to Solve Quadratic Equations LOC: 11.RF5

TOP: Relations and Functions KEY: Procedural Knowledge

**56.** ANS: D PTS: 0 DIF: Easy

REF: 3.3 Using Square Roots to Solve Quadratic Equations LOC: 11.RF5

TOP: Relations and Functions KEY: Procedural Knowledge

**57.** ANS: D PTS: 0 DIF: Easy

REF: 3.3 Using Square Roots to Solve Quadratic Equations LOC: 11.RF5

TOP: Relations and Functions KEY: Procedural Knowledge

**58.** ANS: C PTS: 0 DIF: Moderate

REF: 3.3 Using Square Roots to Solve Quadratic Equations LOC: 11.RF5

TOP: Relations and Functions KEY: Problem-Solving Skills | Procedural Knowledge

**59.** ANS: B PTS: 0 DIF: Moderate

REF: 3.3 Using Square Roots to Solve Quadratic Equations LOC: 11.RF5

TOP: Relations and Functions KEY: Procedural Knowledge

**60.** ANS: A PTS: 0 DIF: Moderate

REF: 3.3 Using Square Roots to Solve Quadratic Equations LOC: 11.RF5

TOP: Relations and Functions KEY: Procedural Knowledge

**61.** ANS: D PTS: 0 DIF: Easy

REF: 3.3 Using Square Roots to Solve Quadratic Equations LOC: 11.RF5

TOP: Relations and Functions KEY: Procedural Knowledge

**62.** ANS: A PTS: 0 DIF: Easy

REF: 3.4 Developing and Applying the Quadratic Formula LOC: 11.RF5

TOP: Relations and Functions KEY: Conceptual Understanding

**63.** ANS: C PTS: 0 DIF: Moderate

REF: 3.4 Developing and Applying the Quadratic Formula LOC: 11.RF5

TOP: Relations and Functions KEY: Procedural Knowledge

**64.** ANS: D PTS: 0 DIF: Moderate

REF: 3.4 Developing and Applying the Quadratic Formula LOC: 11.RF5

TOP: Relations and Functions KEY: Procedural Knowledge

**65.** ANS: C PTS: 0 DIF: Moderate

REF: 3.4 Developing and Applying the Quadratic Formula LOC: 11.RF5

TOP: Relations and Functions KEY: Procedural Knowledge

**66.** ANS: D PTS: 0 DIF: Difficult

REF: 3.4 Developing and Applying the Quadratic Formula LOC: 11.RF5

TOP: Relations and Functions KEY: Procedural Knowledge

**67.** ANS: B PTS: 0 DIF: Easy REF: 3.5 Interpreting the Discriminant

LOC: 11.RF5 TOP: Relations and Functions KEY: Conceptual Understanding

**68.** ANS: C PTS: 0 DIF: Easy REF: 3.5 Interpreting the Discriminant

LOC: 11.RF5 TOP: Relations and Functions KEY: Conceptual Understanding

**69.** ANS: D PTS: 0 DIF: Easy REF: 3.5 Interpreting the Discriminant

LOC: 11.RF5 TOP: Relations and Functions KEY: Procedural Knowledge

**70.** ANS: A PTS: 0 DIF: Easy REF: 3.5 Interpreting the Discriminant

LOC: 11.RF5 TOP: Relations and Functions KEY: Procedural Knowledge

**71.** ANS: B PTS: 0 DIF: Easy

REF: 4.1 Properties of a Quadratic Function LOC: 11.RF4

TOP: Relations and Functions KEY: Conceptual Understanding

**72.** ANS: C PTS: 0 DIF: Easy

REF: 4.1 Properties of a Quadratic Function LOC: 11.RF4

TOP: Relations and Functions KEY: Procedural Knowledge

**73.** ANS: D PTS: 0 DIF: Easy

REF: 4.1 Properties of a Quadratic Function LOC: 11.RF4

TOP: Relations and Functions KEY: Procedural Knowledge

**74.** ANS: A PTS: 0 DIF: Moderate

REF: 4.1 Properties of a Quadratic Function LOC: 11.RF4

TOP: Relations and Functions KEY: Procedural Knowledge

**75.** ANS: A PTS: 0 DIF: Moderate

REF: 4.1 Properties of a Quadratic Function LOC: 11.RF4

TOP: Relations and Functions KEY: Problem-Solving Skills | Procedural Knowledge

**76.** ANS: B PTS: 0 DIF: Easy

REF: 4.2 Solving a Quadratic Equation Graphically LOC: 11.RF5

TOP: Relations and Functions KEY: Conceptual Understanding

**77.** ANS: A PTS: 0 DIF: Easy

REF: 4.2 Solving a Quadratic Equation Graphically LOC: 11.RF5

TOP: Relations and Functions KEY: Procedural Knowledge

**78.** ANS: C PTS: 0 DIF: Moderate

REF: 6.1 Angles in Standard Position in Quadrant 1 LOC: 11.T2

TOP: Trigonometry KEY: Conceptual Understanding | Procedural Knowledge

**79.** ANS: B PTS: 0 DIF: Easy

REF: 6.1 Angles in Standard Position in Quadrant 1 LOC: 11.T1

TOP: Trigonometry KEY: Conceptual Understanding | Procedural Knowledge

**80.** ANS: A PTS: 0 DIF: Moderate

REF: 6.1 Angles in Standard Position in Quadrant 1 LOC: 11.T2

TOP: Trigonometry KEY: Conceptual Understanding | Procedural Knowledge

**81.** ANS: C PTS: 0 DIF: Easy

REF: 6.1 Angles in Standard Position in Quadrant 1 LOC: 11.T2

TOP: Trigonometry KEY: Procedural Knowledge | Problem-Solving Skills

**82.** ANS: A PTS: 0 DIF: Moderate

REF: 6.1 Angles in Standard Position in Quadrant 1 LOC: 11.T2

TOP: Trigonometry KEY: Procedural Knowledge | Problem-Solving Skills

**83.** ANS: C PTS: 0 DIF: Moderate

REF: 6.1 Angles in Standard Position in Quadrant 1 LOC: 11.T2

TOP: Trigonometry KEY: Procedural Knowledge | Problem-Solving Skills

**84.** ANS: D PTS: 0 DIF: Moderate

REF: 6.1 Angles in Standard Position in Quadrant 1 LOC: 11.T2

TOP: Trigonometry KEY: Procedural Knowledge | Problem-Solving Skills

**85.** ANS: D PTS: 0 DIF: Easy

REF: 6.2 Angles in Standard Position in All Quadrants LOC: 11.T1

TOP: Trigonometry KEY: Conceptual Understanding | Procedural Knowledge

**86.** ANS: A PTS: 0 DIF: Easy

REF: 6.2 Angles in Standard Position in All Quadrants LOC: 11.T1

TOP: Trigonometry KEY: Conceptual Understanding | Procedural Knowledge

**87.** ANS: B PTS: 0 DIF: Moderate

REF: 6.2 Angles in Standard Position in All Quadrants LOC: 11.T2

TOP: Trigonometry KEY: Conceptual Understanding | Procedural Knowledge

**88.** ANS: A PTS: 0 DIF: Moderate

REF: 6.2 Angles in Standard Position in All Quadrants LOC: 11.T2

TOP: Trigonometry KEY: Conceptual Understanding | Procedural Knowledge

**89.** ANS: D PTS: 1 DIF: Moderate

REF: 6.2 Angles in Standard Position in All Quadrants LOC: 11.T2

TOP: Trigonometry KEY: Conceptual Understanding | Procedural Knowledge

**90.** ANS: B PTS: 0 DIF: Moderate

REF: 6.2 Angles in Standard Position in All Quadrants LOC: 11.T2

TOP: Trigonometry KEY: Conceptual Understanding | Procedural Knowledge

**91.** ANS: A PTS: 0 DIF: Moderate REF: 6.3 Constructing Triangles

LOC: 11.T3 TOP: Trigonometry KEY: Procedural Knowledge

**92.** ANS: D PTS: 0 DIF: Moderate REF: 6.4 The Sine Law

LOC: 11.T3 TOP: Trigonometry

KEY: Conceptual Understanding | Procedural Knowledge

**93.** ANS: B PTS: 0 DIF: Moderate REF: 6.4 The Sine Law

LOC: 11.T3 TOP: Trigonometry

KEY: Conceptual Understanding | Procedural Knowledge

**94.** ANS: B PTS: 0 DIF: Moderate REF: 6.4 The Sine Law

LOC: 11.T3 TOP: Trigonometry

KEY: Conceptual Understanding | Procedural Knowledge

**95.** ANS: B PTS: 0 DIF: Moderate REF: 6.4 The Sine Law

LOC: 11.T3 TOP: Trigonometry

KEY: Conceptual Understanding | Procedural Knowledge

**96.** ANS: D PTS: 1 DIF: Moderate REF: 6.5 The Cosine Law

LOC: 11.T3 TOP: Trigonometry

KEY: Conceptual Understanding | Procedural Knowledge

**97.** ANS: C PTS: 1 DIF: Moderate REF: 6.5 The Cosine Law

LOC: 11.T3 TOP: Trigonometry

KEY: Conceptual Understanding | Procedural Knowledge

**98.** ANS: A PTS: 1 DIF: Moderate REF: 6.5 The Cosine Law

LOC: 11.T3 TOP: Trigonometry

KEY: Conceptual Understanding | Procedural Knowledge

**99.** ANS: D PTS: 1 DIF: Moderate REF: 6.5 The Cosine Law

LOC: 11.T3 TOP: Trigonometry

KEY: Conceptual Understanding | Procedural Knowledge

**100.** ANS: A PTS: 1 DIF: Moderate REF: 6.5 The Cosine Law

LOC: 11.T3 TOP: Trigonometry

KEY: Conceptual Understanding | Procedural Knowledge

**SHORT ANSWER**

**1.** ANS:

a) 

b) 

c) The equation has no real root.

d) 

PTS: 0 DIF: Moderate REF: 2.5 Solving Radical Equations

LOC: 11.AN3 TOP: Relations and Functions

KEY: Conceptual Understanding | Procedural Knowledge

**2.** ANS:



PTS: 0 DIF: Easy REF: 3.1 Factoring Polynomial Expressions

LOC: 11.RF1 TOP: Relations and Functions KEY: Procedural Knowledge

**3.** ANS:



PTS: 0 DIF: Moderate REF: 3.1 Factoring Polynomial Expressions

LOC: 11.RF1 TOP: Relations and Functions KEY: Procedural Knowledge

**4.** ANS:



PTS: 0 DIF: Moderate REF: 3.2 Solving Quadratic Equations by Factoring

LOC: 11.RF5 TOP: Relations and Functions

KEY: Problem-Solving Skills | Procedural Knowledge

**5.** ANS:

*x* = 

PTS: 0 DIF: Moderate REF: 3.2 Solving Quadratic Equations by Factoring

LOC: 11.AN3 TOP: Algebra and Number KEY: Procedural Knowledge

**6.** ANS:

There are 2 numbers: 5 and –8

PTS: 0 DIF: Moderate REF: 3.2 Solving Quadratic Equations by Factoring

LOC: 11.RF5 TOP: Relations and Functions

KEY: Problem-Solving Skills | Procedural Knowledge

**7.** ANS:



PTS: 0 DIF: Moderate REF: 3.2 Solving Quadratic Equations by Factoring

LOC: 11.RF5 TOP: Relations and Functions KEY: Procedural Knowledge

**8.** ANS:

The velocity of the object is approximately 43.1 m/s.

PTS: 0 DIF: Easy REF: 3.3 Using Square Roots to Solve Quadratic Equations

LOC: 11.RF5 TOP: Relations and Functions

KEY: Problem-Solving Skills | Procedural Knowledge

**9.** ANS:

 or 

PTS: 0 DIF: Difficult REF: 3.3 Using Square Roots to Solve Quadratic Equations

LOC: 11.RF5 TOP: Relations and Functions KEY: Procedural Knowledge

**10.** ANS:



PTS: 0 DIF: Difficult REF: 3.4 Developing and Applying the Quadratic Formula

LOC: 11.RF5 TOP: Relations and Functions KEY: Procedural Knowledge

**11.** ANS:

Approximately 18.1 s

PTS: 0 DIF: Moderate REF: 3.4 Developing and Applying the Quadratic Formula

LOC: 11.RF5 TOP: Relations and Functions

KEY: Problem-Solving Skills | Procedural Knowledge

**12.** ANS:

a) 

b) The discriminant is positive, so there are 2 real roots.

PTS: 0 DIF: Moderate REF: 3.5 Interpreting the Discriminant

LOC: 11.RF5 TOP: Relations and Functions

KEY: Conceptual Understanding | Procedural Knowledge

**13.** ANS:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| ***x*** | 3 | 2 | 1 | 0 | 1 | 2 | 3 |
| ***y*** | –20 | –5 | 4 | 7 | 4 | –5 | –20 |



a) The domain is: 

b) The range is: , 

PTS: 0 DIF: Moderate REF: 4.1 Properties of a Quadratic Function

LOC: 11.RF4 TOP: Relations and Functions

KEY: Conceptual Understanding | Procedural Knowledge

**14.** ANS:

The graph does not intersect the *x*-axis, so the equation  has no real roots.

PTS: 0 DIF: Easy REF: 4.2 Solving a Quadratic Equation Graphically

LOC: 11.RF5 TOP: Relations and Functions KEY: Procedural Knowledge

**15.** ANS:



PTS: 0 DIF: Easy REF: 6.2 Angles in Standard Position in All Quadrants

LOC: 11.T1 TOP: Trigonometry KEY: Procedural Knowledge

**16.** ANS:

Point P is  units from the origin.

PTS: 0 DIF: Easy REF: 6.2 Angles in Standard Position in All Quadrants

LOC: 11.T2 TOP: Trigonometry KEY: Procedural Knowledge

**17.** ANS:

a) The reference angle is 16°.

b) The other angles that have the same reference angle are:





PTS: 0 DIF: Moderate REF: 6.2 Angles in Standard Position in All Quadrants

LOC: 11.T1 TOP: Trigonometry KEY: Conceptual Understanding

**18.** ANS:

Two triangles can be constructed.

PTS: 0 DIF: Easy REF: 6.4 The Sine Law

LOC: 11.T3 TOP: Trigonometry

KEY: Conceptual Understanding | Procedural Knowledge

**19.** ANS:

No, the Cosine Law cannot be used because the given angle is not contained between the two given sides.

PTS: 1 DIF: Easy REF: 6.5 The Cosine Law

LOC: 11.T3 TOP: Trigonometry

KEY: Conceptual Understanding | Communication

**20.** ANS:

E = 107°

PTS: 1 DIF: Moderate REF: 6.5 The Cosine Law

LOC: 11.T3 TOP: Trigonometry

KEY: Conceptual Understanding | Procedural Knowledge

**PROBLEM**

**1.** ANS:



Point A: |12| = 12, so Point A is 12 units from 0.

Point B: |9| = 9, so Point B is 9 units from 0.

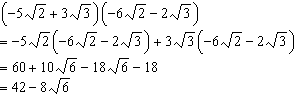
Point C: || = , so Point C is  units from 0.

Point D: |–18.5| = 18.5, so Point D is 18.5 units from 0.

PTS: 0 DIF: Easy REF: 2.1 Absolute Value of a Real Number

LOC: 11.AN1 TOP: Relations and Functions KEY: Conceptual Understanding

**2.** ANS:

**

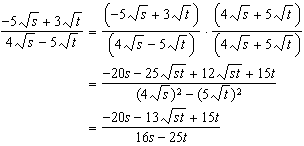
PTS: 0 DIF: Easy REF: 2.4 Multiplying and Dividing Radical Expressions

LOC: 11.AN2 TOP: Relations and Functions

KEY: Procedural Knowledge | Communication

**3.** ANS:

a) 

b) 

PTS: 0 DIF: Moderate REF: 2.4 Multiplying and Dividing Radical Expressions

LOC: 11.AN2 TOP: Relations and Functions

KEY: Conceptual Understanding | Procedural Knowledge | Communication

**4.** ANS:

Since the left side does not equal the right side,  is not a root of the equation.

PTS: 0 DIF: Easy REF: 2.5 Solving Radical Equations

LOC: 11.AN3 TOP: Relations and Functions

KEY: Procedural Knowledge | Communication

**5.** ANS:

Write  = 

Equate the constant terms.

If  is a factor, then , so 

Substitute this value for *h* in , then expand.



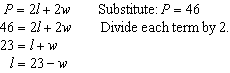
The value of *k* is 12.

PTS: 0 DIF: Difficult REF: 3.1 Factoring Polynomial Expressions

LOC: 11.RF1 TOP: Relations and Functions

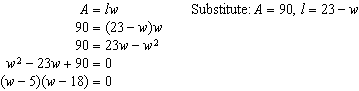
KEY: Communication | Problem-Solving Skills

**6.** ANS:



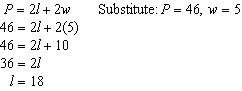
The length of the slab, in metres, is .

The area of the slab is 90 m2. Use the formula .



Either *w* = 5 or *w* = 18

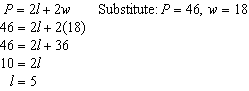
Determine the value of *l* when *w* = 5.



The width of the slab is 5 m and its length is 18 m.

Or

Determine the value of *l* when *w* = 18.



The width of the slab is 18 m and its length is 5 m.

So, there is one slab of dimensions 18 m by 5 m.

PTS: 0 DIF: Difficult REF: 3.2 Solving Quadratic Equations by Factoring

LOC: 11.RF5 TOP: Relations and Functions

KEY: Communication | Problem-Solving Skills

**7.** ANS:

|  |  |
| --- | --- |
|  | Substitute:  Divide each term by 5.  Complete the square. |

The left side is a perfect square and the right side is positive, so there is at least one solution to this equation. The ball will reach a height of 15 m.

PTS: 0 DIF: Moderate REF: 3.3 Using Square Roots to Solve Quadratic Equations

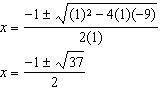
LOC: 11.RF5 TOP: Relations and Functions

KEY: Communication | Problem-Solving Skills

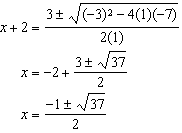
**8.** ANS:

a) 

Substitute:  in: 



b) Substitute:  in: 



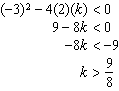
PTS: 0 DIF: Difficult REF: 3.4 Developing and Applying the Quadratic Formula

LOC: 11.RF5 TOP: Relations and Functions KEY: Problem-Solving Skills

**9.** ANS:

For an equation to have no real roots, 

Substitute: 



For  to have no real roots, *k* must be greater than .

Sample response: A possible value of *k* is 3. So, an equation with no real roots is: 

PTS: 0 DIF: Moderate REF: 3.5 Interpreting the Discriminant

LOC: 11.RF5 TOP: Relations and Functions

KEY: Communication | Problem-Solving Skills

**10.** ANS:

For , graph . On a graphing calculator, press:  . Move the cursor to the left of the 1st *x*-intercept, then press ; move the cursor to the right of the intercept and press . The screen displays . Repeat the process for the 2nd *x*-intercept to get . The roots are  and .

PTS: 0 DIF: Moderate REF: 4.2 Solving a Quadratic Equation Graphically

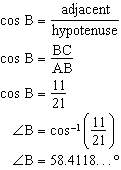
LOC: 11.RF5 TOP: Relations and Functions

KEY: Communication | Problem-Solving Skills

**11.** ANS:

First determine the measure of B.

In right ABC,



In a right triangle, when one acute angle is **, the other acute angle is .



So, B is approximately 58.4 and A is approximately 31.6.

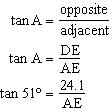
PTS: 0 DIF: Moderate REF: 6.1 Angles in Standard Position in Quadrant 1

LOC: 11.T2 TOP: Trigonometry

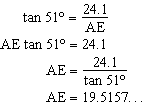
KEY: Conceptual Understanding | Communication

**12.** ANS:

In right ADE, . DE is opposite A and AE is adjacent to A.



Solve the equation for AE.



The height of the tower is approximately 19.5 m.

I am assuming that the ground is level.

PTS: 0 DIF: Moderate REF: 6.1 Angles in Standard Position in Quadrant 1

LOC: 11.T2 TOP: Trigonometry

KEY: Communication | Problem-Solving Skills

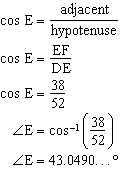
**13.** ANS:

|  |  |
| --- | --- |
| Label the right triangles ABC and DEF.  In ABC, B represents the angle of inclination of the guy wire attached to the shorter building.  In ABC, |  |

The angle of inclination of the guy wire attached to the shorter building is approximately 48.1°.

In DEF, E represents the angle of inclination of the guy wire attached to the taller building.

In DEF,



The angle of inclination of the guy wire attached to the taller building is approximately 43.0°.

The student is not correct. The angles of inclination are different.

PTS: 0 DIF: Difficult REF: 6.1 Angles in Standard Position in Quadrant 1

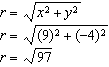
LOC: 11.T2 TOP: Trigonometry

KEY: Communication | Problem-Solving Skills

**14.** ANS:

Determine the distance *r* from the origin to P.

, 



Use: 

The reference angle, to the nearest degree, is:



Since *x* is positive and *y* is negative, the terminal arm is in Quadrant 4, and ** is approximately .



PTS: 0 DIF: Moderate REF: 6.2 Angles in Standard Position in All Quadrants

LOC: 11.T2 TOP: Trigonometry

KEY: Procedural Knowledge | Communication

**15.** ANS:

Possible solution:



|  |  |  |  |
| --- | --- | --- | --- |
| **Length of BC (cm)** | **Value of** | **How does  compare with sin A?** | **Description of possible triangles** |
| 5 | 0.8333... |  | No triangles are possible. |
| 6 | 1 |  | 1 isosceles triangle |
| 7 | 1.1666... |  | 1 scalene triangle |
| 5.9 | 0.9833... |  | 2 scalene triangles |

PTS: 0 DIF: Moderate REF: 6.3 Constructing Triangles

LOC: 11.T3 TOP: Trigonometry

KEY: Conceptual Understanding | Problem-Solving Skills

**16.** ANS:

The treasure chest could be between the two divers or on one side of both divers.

Case 1: The treasure chest C is between the two divers, A and B.

|  |  |
| --- | --- |
|  |  |

The treasure chest is approximately 29 m and 39 m from the divers.

Case 2: The treasure chest C is on one side of both divers A and B.

|  |  |
| --- | --- |
|  |  |

The treasure chest is approximately 104 m and 141 m from the divers.

PTS: 0 DIF: Difficult REF: 6.4 The Sine Law

LOC: 11.T3 TOP: Trigonometry

KEY: Communication | Problem-Solving Skills

**17.** ANS:

Let C represent the location of the school of fish and *d* represent its distance below sea level.

The school of fish could be between the two boats or on one side of both boats.

Case 1: The school of fish is between boats A and B.

|  |  |
| --- | --- |
|  |  |

The school of fish is approximately 8 m below sea level.

Case 2: The school of fish is on one side of both boats A and B.

|  |  |
| --- | --- |
| In right |  |

The school of fish is approximately 29 m below sea level.

PTS: 0 DIF: Difficult REF: 6.4 The Sine Law

LOC: 11.T3 TOP: Trigonometry

KEY: Communication | Problem-Solving Skills

**18.** ANS:

a) Sketch the triangle.

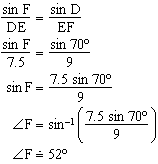


Use the ratio  to determine the number of possible triangles.



Since , one triangle is possible.

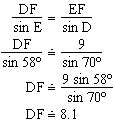
b) Solve for F:



Solve for E:



Solve for DF:



So, in DEF, the approximate measures are: E = 58°, F = 52°, and DF = 8.1 cm.

PTS: 0 DIF: Difficult REF: 6.4 The Sine Law

LOC: 11.T3 TOP: Trigonometry

KEY: Procedural Knowledge | Communication

**19.** ANS:

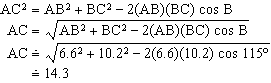
Draw lines perpendicular to AD through B and through C.

|  |  |
| --- | --- |
| In ABE: |  |

In ABC:



Use the Cosine Law to determine AC.



The length of diagonal AC is approximately 14.3 cm.

PTS: 1 DIF: Difficult REF: 6.5 The Cosine Law

LOC: 11.T3 TOP: Trigonometry

KEY: Procedural Knowledge | Communication | Problem-Solving Skills

**20.** ANS:

Sketch a diagram to represent their trip from A, through B, to C.

|  |  |
| --- | --- |
| Determine the measure of B in ABC.    In ABC: |  |
| Determine the measure of angle **.    Determine the angle bearing, **. |  |

The straight-line distance is approximately 2.1 km.

The bearing of the end point from the start point is approximately 250°.

PTS: 1 DIF: Difficult REF: 6.5 The Cosine Law

LOC: 11.T3 TOP: Trigonometry

KEY: Procedural Knowledge | Communication | Problem-Solving Skills